IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

MICROSOFT CORPORATION, Plaintiff, v. ALCATEL-LUCENT ENTERPRISE and GENESYS TELECOMMUNICATIONS LABORATORIES, INC., Defendants.	)	C.A. No. 07-090 (SLR) **REDACTED – PUBLIC VERSION**

OPENING CLAIM CONSTRUCTION BRIEF OF DEFENDANTS ALCATEL-LUCENT ENTERPRISE AND GENESYS

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TABLE OF CONTENTS

NATURE AND STAGE OF PROCEEDINGS 1

SUMMARY OF ARGUMENT 1

STATEMENT OF FACTS 1

ARGUMENT 2

A. Standard Of Review 2

B. Disputed Claim Constructions of the O'Neal Patents 2

1. Background of The O'Neal Patents 3

2. The Single Graphical Menu Limitation Requires All Options for Each Service of the Subscriber on One Menu 4

3. The Telephony Server Must Audibly Represent the Same Communication Options as the Single Graphical Menu 13

4. The Enable/Disable Option Limitation 16

5. The Unified Messaging System Limitation 17

C. Disputed Claim Constructions Of The '289 Patent 19

1. Background of the '289 Patent 19

2. Construction of "receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party" 20

3. "[A]ctivity of a user computer" means "active or idle" 23

4. Constructions of "telephone network" and "computer network" 27

D. Disputed Claim Constructions Of The '439 Patent 28

1. Background of the '439 Patent 28

2. Construction of "current activity of subscribers on the computer network or according to current activity of the user on the computer network" 30

3. Constructions of "telephone network" and "computer network" constructions. 38

CONCLUSION 39

TABLE OF AUTHORITIES

CASES **PAGE**

Abbott Labs. v. Novopharm Ltd.,
323 F.3d 1324 (Fed. Cir. 2003).....24, 26

Bell Atl. Network Servs., Inc. v. Covad Comm. Group, Inc.,
262 F.3d 1258 (Fed. Cir. 2001).....2, 20

C.R. Bard, Inc. v. U.S. Surgical Corp.,
388 F.3d 858 (Fed. Cir. 2004).....25

Chimie v. PPG Indus.,
402 F.3d 1371 (Fed. Cir. 2005).....2

Eaton Corp. v. Rockwell International Corp.,
323 F.3d 1332 (Fed. Cir. 2003).....15

Ekchian v. Home Depot, Inc.,
104 F.3d 1299 (Fed. Cir. 1997).....10, 35

Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.,
214 F.3d 1302 (Fed. Cir. 2000).....12

Flex-Rest, LLC v. Steelcase, Inc.,
455 F.3d 1351 (Fed. Cir. 2006).....37

Innova/Pure Water, Inc. v. Safari Water Filtration Sys.,
381 F.3d 1111 (Fed. Cir. 2004).....6

Lear Siegler, Inc. v. Aeroquip Corp.,
733 F.2d 881, 889 (Fed. Cir. 1984).....2

Liquid Dynamics Corp. v. Vaughan Co.,
355 F.3d 1361 (Fed. Cir. 2004).....2

Microsoft Corp. v. Multi-Tech Sys., Inc.,
357 F.3d 1340 (Fed. Cir. 2004).....23, 25

North Am. Container v. Plastipak Packaging, Inc.,
415 F.3d 1335 (Fed. Cir. 2005).....11

NTP, Inc v. Research in Motion, Ltd.,
418 F.3d 1282 (Fed. Cir. 2005).....6

O2 Micro Intl Ltd. v. Beyond Innovation Tech. Co., et al,
No. 07-1302, 2008 U.S. App. LEXIS 7053, (Fed. Cir. April 3, 2008)..... 20-21

Phillips v. AWH Corp.,
415 F.3d 1303 (Fed. Cir. 2005), cert denied, 546 U.S. 1170 (2006) ..... *passim*

TABLE OF AUTHORITIES, cont'd

CASE **PAGE**

Pods, Inc. v. Porta Stor, Inc.,
484 F.3d 1359 (Fed. Cir. 2007).....15

Renishaw PLC v. Marposs Societá Per Azion,
158 F.3d 1243 (Fed. Cir. 1998).....21

ResQNET.com, Inc. v. Lansa, Inc.,
346 F.3d 1374 (Fed. Cir. 2003).....5, 7

Rheox, Inc. v. Entact, Inc.,
276 F.3d 1319 (Fed. Cir. 2002).....11, 35

Rhine v. Casio, Inc.,
183 F.3d 1342 (Fed. Cir. 1999).....18

SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.
242 F.3d 1337 (Fed. Cir. 2001).....10

Sentry Protection Prods. v. Eagle Mfg. Co.,
400 F.3d 910, 915 (Fed. Cir. 2005).....7, 10

Stumbo v. Eastman Outdoors, Inc.,
508 F.3d 1358 (Fed. Cir. 2007).....5

Tate Access Floors, Inc. v. Interface Arch. Resources, Inc.,
279 F.3d 1357 (Fed. Cir. 2002).....7

Terlep v. Brinkmann Corp.,
418 F.3d 1379 (Fed. Cir. 2005).....2

Verizon Serv. Corp. v. Vonage Holdings Corp.,
503 F.3d 1295 (Fed. Cir. Sept. 26, 2007).....10

Vitronics Corp. v. Conceptronic, Inc.,
90 F.3d 1576 (Fed. Cir. 1996).....2, 20

NATURE AND STAGE OF PROCEEDINGS

Pursuant to the Court's August 3, 2007 Scheduling Order (D.I. 26), Defendants Alcatel-Lucent Enterprise ("ALE") and Genesys Telecommunications Laboratories ("Genesys") submit this opening claim construction brief. Microsoft Corporation ("Microsoft") asserts four patents in this action: U.S. Patent No. 6,263,064 ("'064 Patent"), U.S. Patent No. 6,728,357 ("'357 Patent") (collectively referred to as "the O'Neal Patents"), U.S. Patent No. 6,430,289 ("'289 Patent"), and U.S. Patent No. 6,421,439 ("'439 Patent") (Exs. 1-4.) Microsoft asserts the O'Neal and '439 Patents against ALE, and Microsoft asserts the '289 Patent against ALE and Genesys. This brief addresses the disputed terms of all four patents. The O'Neal Patents share an identical specification, and unless specifically noted otherwise, are addressed together. The parties submitted a Joint Claim Construction Statement (D.I. 150) ("Joint Statement") on May 2, 2008, including additional constructions to which the parties have agreed.[1] (*See* Ex. 6 (Joint Statement).)

SUMMARY OF ARGUMENT

ALE's proposed constructions of the disputed terms are provided in the Joint Statement and are addressed in the Argument section for each patent.

STATEMENT OF FACTS

The relevant facts are discussed in the Argument section for each patent.

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[1] The parties litigated the same patents in the International Trade Commission (ITC). For purposes of that investigation, the parties agreed upon several constructions. Additionally, the ALJ in the ITC construed several terms (including one previously agreed upon by the parties where the ALJ believed a dispute still remained). The chart attached as Exhibit 5 shows the terms upon which the parties agreed in the ITC, as well as the constructions provided by the ALJ. At the time of filing of this brief, the Commission is reviewing the ALJ's construction of one of the terms of the '439 patent noted in the attached chart.

ARGUMENT

A. Standard Of Review

Claim construction is a question of law and "is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Terlep v. Brinkmann Corp.*, 418 F.3d 1379, 1382 (Fed. Cir. 2005). The purpose of claim construction is to "assign a fixed, unambiguous, legally operative meaning to the claim." *Liquid Dynamics Corp. v. Vaughan Co.*, 355 F.3d 1361, 1367 (Fed. Cir. 2004).

In construing claims, a court should look to intrinsic evidence consisting of the language of the claims, the specification and the prosecution history as it "is the most significant source of the legally operative meaning of disputed claim language." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("*Vitronics*"); *see Bell Atl. Network Servs., Inc. v. Covad Comm. Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The claims themselves "provide substantial guidance as to the meaning of particular claim terms." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005), cert denied, 546 U.S. 1170 (2006) ("*Phillips*") (*citing Vitronics*, 90 F.3d at 1582). When the claim language lacks sufficient clarity to ascertain the scope of the claims, courts look to the written description for guidance. *See Chimie v. PPG Indus.*, 402 F.3d 1371, 1377 (Fed. Cir. 2005). A patentee may deviate from the conventional meaning of a particular claim term by making the intended meaning of a particular claim term clear (1) in the specification or (2) during the patent's prosecution history. *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984) ("*Lear Siegler*").

B. Disputed Claim Constructions of the O'Neal Patents

Microsoft asserts claims 1, 3, 8, 9, 11 and 20 of the '064 Patent and Claims 1, 6 and 17 of the '357 Patent against ALE. There are four disputed terms from the O'Neal Patents

requiring construction: (1) whether the "single graphical menu" must display the options for each communication service; (2) whether the telephony server must audibly represent the same options displayed by the "single graphical menu;" (3) whether "enabling or disabling" means to turn on or off; and (4) whether the "Unified Messaging System" limitation requires the ability to retrieve a message from the central message storage of the system after that message has already been retrieved using a different device. Construction of these disputed terms will be important to resolving the non-infringement and invalidity issues addressed in ALE's motion for summary judgment of non-infringement and invalidity of the O'Neal Patents.[2]

1. Background of The O'Neal Patents

The '064 Patent, entitled "Centralized Communication Control Center for Visually and Audibly Updating Communication Options Associated with Communication Services of a Unified Messaging System and Methods Therefore," issued on July 17, 2001, to named inventors Stephen O'Neal and John Jiang. The '064 Patent derives from Application No. 09/239,585, filed on January 29, 1999. The '064 Patent is assigned to Microsoft.

The '357 Patent is entitled "Centralized Communication Control Center and Methods Therefor." It issued on April 27, 2004 to named inventors Stephen C. O'Neal and John Jiang. The '357 Patent derives from Application No. 09/907,051, filed on July 17, 2001, which is a continuation of application no. 09/239,585, filed on January 29, 1999 (which issued as the '064 Patent). The '357 Patent is assigned to Microsoft, and shares the same specification as the '064 Patent.

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[2] In particular, if the Court adopts ALE's constructions with respect to either the single graphical menu or telephony server limitations, then ALE's accused products do not infringe. Furthermore, ALE's accused products do not infringe the O'Neal Patents based on Microsoft's own construction of the Unified Messaging System limitation. Under Microsoft's proposed constructions of the single graphical menu and telephony server limitations, the asserted claims of the O'Neal Patents are invalid.

The O'Neal Patents describe a method and apparatus for a computer-implemented centralized control center that permits:

> a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal.

(Ex. 1 ('064 Patent) at Abstract.) In other words, the O'Neal Patents pertain to a system where the user can configure communications services and options graphically or telephonically. The centralized control center includes a database that maintains a user's account and stores a user's "communication options [that] include parameters associated with individual ones of the communication services and routings among the communication services." (*Id.*) The control center has a computer server that "visually display[s] the communication options on one of the display terminals." (*Id.* at 4:29-31.) The computer server is configured to allow a user to make changes to his communication options from a computer via a graphical user interface ("GUI") or a telephone via a telephony user interface ("TUI"). (*Id.* at 4:58-65.)

2. The Single Graphical Menu Limitation Requires All Options for Each Service of the Subscriber on One Menu

Disputed Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"a single graphical menu for displaying said communication options for each of said communication services at the [s]ame time" ['064 Patent: Claims 1, 3, 8, 9, 11, 20; '357 Patent: Claims 1, 6, 17]	"A single graphical menu for displaying at least a first communications service and option and a second communication service and option at the same time"	"one graphical menu that shows all of the communication options associated with the subscriber's communication services"

(Ex. 6 (Joint Statement (D.I. 150)) at p. 4.)

The single graphical menu element requires "a single graphical menu for displaying said communication options for each of said communication services at the same

time." The plain language of the claims require that the options for each communication service be displayed on "a single graphical menu" "at the same time." *See ResQNET.com, Inc. v. Lansa, Inc.*, 346 F.3d 1374, 1379 (Fed. Cir. 2003) (stating the term "each" means "all" or "each (and every)").

Microsoft ignores the plain language and offers a construction that would read the terms "single," "each" and "at the same time" out of the claims. Microsoft ignores the strong presumption that the disputed elements be given their plain meaning in favor of a construction calculated to create infringement. *See Stumbo v. Eastman Outdoors, Inc.*, 508 F.3d 1358, 1362 (Fed. Cir. 2007) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005)) ("When construing claims, a court must begin by look[ing] to the words of the claims themselves" and words of a claim "are generally given their ordinary and customary meaning" as understood by a person of ordinary skill in the art in question.) Rather than giving effect to the language and requiring a single graphical menu that displays the options associated with each of the subscriber's communications services, Microsoft offers a construction requiring the claimed single graphical menu to display only one option for two communication services. Under Microsoft's view, this element is met if the subscribers' options and services are displayed on ***multiple*** graphical menus. This makes no sense, is a clear evasion of the words chosen to claim the patented invention and is nothing more than a not-so-subtle attempt to rewrite the claims to cover a commercial product.

If Microsoft is correct, then there would have been no reason for the applicants to add much of what they did to the claims. Indeed, rather than reciting "a ***single*** graphical menu for displaying ***said*** communication options for ***each*** of said communication services ***at the same time***" the claim would say "a graphical menu for displaying communication options for

communication services" and mean the same thing.[3] Because each term in the claims is presumed to have meaning, Microsoft's construction rendering many words meaningless is instantly disfavored. *See NTP, Inc v. Research in Motion, Ltd.*, 418 F.3d 1282, 1300 (Fed. Cir. 2005) (citing *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004)).

Microsoft's construction not only runs afoul of the plain language of the claim, but ignores critical prosecution history. The applicants added the single graphical menu limitation in response to prior art and argued that: "[i]n contrast [to the cited prior art], ***the present invention does not have to access multiple screens to modify options***. In fact, the communication options, ***which are displayed on a single screen***, may be modified as needed with a few keystrokes." (Ex. 7 ('064 Patent Prosecution History) at MSAL 01002 (bold italics emphasis added)). There is no ambiguity here, the prior art disclosed accessing multiple screens to modify options, and the claimed invention requires accessing a single menu. To the extent there is any lack of clarity in the claim language, applicant surrendered any alleged coverage of a system where multiple menus are used to display options for the communication services. The support for ALE's proposed constructions of the single graphical menu limitation is discussed further below.

a. The Plain Meaning of the Claim Language Supports ALE's Construction

The plain language of the claims supports ALE's construction that the single graphical menu limitation requires one graphical menu that shows all of the communication

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[3] Microsoft argues that the claimed single graphical menu needs to display at least one communication option for at least two communication services based upon other limitations in the claim.

options associated with the subscriber's communication services. In contrast, Microsoft's construction reads the words "single" and "each" out of the claim.

(1) "Single" Means One and Only One

The Federal Circuit has repeatedly construed the modifier "single" to mean one and only one consistent with its plain meaning. *See Sentry Protection Prods. v. Eagle Mfg. Co.*, 400 F.3d 910, 915 (Fed. Cir. 2005) (construing the term "single unitary part" to mean "a single part, which is complete by itself without additional pieces"); *Tate Access Floors, Inc. v. Interface Arch. Resources, Inc.*, 279 F.3d 1357, 1370-71 (Fed. Cir. 2002) (explaining that by using the claim language "a single visible decorative layer" the patentee constricted the term to mean "one and only one particular layer"). This interpretation is consistent with the ordinary dictionary meaning of "single," which is "[c]onsisting of one part, aspect, or section . . . [c]onsisting of one in number." (Ex. 8 (*American Heritage Dictionary*) at 1625.) *See Phillips*, 415 F.3d at 1322 ("Dictionaries or comparable sources are often useful to assist in understanding the commonly understood meaning of words and have been used both by our court and the Supreme Court in claim interpretation.").

(2) "Each" Means Each and Every

In accord with its ordinary dictionary meaning, the Federal Circuit has also repeatedly construed "each" as meaning each and every. *See, e.g., ResQNET.com,* 346 F.3d at 1379 (stating the term "each" means each and every). (*See* Ex. 8 (*American Heritage Dictionary*) at 560 (defining "each" to mean "every").) Here, the antecedent basis for "each of said communication services" is the "plurality of communication services" as recited in the preamble. Accordingly, the "single graphical menu for displaying said communication options ***for each of said communication services***" must display the communication options "for each," of the plurality of communication services to which the user has subscribed. Although the claim

also requires that there be at least two communication services to meet the preamble limitation of a plurality of communication services, the single graphical menu limitation requires that the options for *each* communication service to which the user has subscribed be displayed on the single graphical menu. (Ex. 1 ('064 Patent) at 8:39-42 and 18:32-18:34.) For example, if the user has subscribed to three services, then the options for each of those three services must be displayed on the single graphical menu at the same time.

Microsoft's construction that the single graphical menu need only display the options for two of the communication services regardless of how many services the subscriber has eliminates the word "each" from the claim, and thus, is contrary to the plain language of the claim. In fact, under Microsoft's construction, the subject phrase could read "a graphical menu for displaying communication options for a plurality of communication services" and it would mean exactly the same thing. Microsoft's rewrite of the claim reads out the very limitations that the applicants added and emphasized in an attempt to overcome the prior art.

b. The Prosecution History Mandates ALE's Construction

(1) The Applicants Added the Single Graphical Menu Limitation In Response to Prior Art Rejections and Attempted to Distinguish from the Prior Art by Arguing that the Present Invention Did Not Require Multiple Screens to Display Options

As originally filed, claim 1 of the '064 Patent application did not include the "single graphical menu" limitation. (Ex. 7 ('064 Patent Prosecution History) at MSAL 00793-94.) The Examiner rejected original claim 1 of the '064 Patent application as anticipated by U.S. Patent No. 5,742,905 (the "Pepe Patent").[4] (*Id.* at MSAL 00793-802, 820, 994, and 1001-1002.)

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[4] During the prosecution of the '064 Patent application, the PTO Examiner initially rejected all of the original 22 claims. (Ex. 7 ('064 Patent Prosecution History) at MSAL 00819-825.) The PTO Examiner rejected claims 1-3, 5, 9-13, 15 and 19-21 as anticipated

The Examiner stated that the Pepe Patent "discloses [that] a subscriber may change subscriber communication profile database options audibly . . . and visually." (*Id.* at MSAL 00802.)

In response to the Examiner's rejection, the applicants amended claim 1, adding the "single graphical menu" limitation, and submitted arguments regarding the meaning and scope of this limitation in an attempt to distinguish the cited Pepe Patent. (*Id. at* 00993-994.) In particular, the applicants argued that the claimed single graphical menu shows all of the subscriber's options for each of the communication services on a single screen at the same time:

> In contrast to Pepe, independent claims 1 and 20 of the present application require a **single graphical menu** that is arranged to display the communication options for each of the communication services at the same time. ***That is, the communication options for each of the communication services are simultaneously displayed on a computer terminal when the subscriber employs the display terminal to access the computer-implemented control center through a data-centric network***. . . . Claims 1 and 20 have been amended to better clarify this aspect of the invention.
>
> While Pepe may disclose the use of control options and subscriber profiles, Pepe does not contemplate ***a single graphical menu where only one view is used to display the communication options. Rather, in Pepe, the subscriber must go through a plurality of views independently, wherein the options are displayed at different times*** (See, Col. 34, Line 10- Col. 36, Line 51 and Figures 28-45.) In order to access all of the screens in Pepe, a subscriber must traverse through at least 18 screens as shown in Figures 28-45. ***In contrast, the present invention does not have to access multiple screens to modify options***. In fact, ***the communications options, which are displayed on a single screen***, may be modified as needed with a few keystrokes. Accordingly, it is respectfully submitted that a single graphical menu containing the communication options is neither disclosed nor reasonably suggested by Pepe et al.

(*Id.* at MSAL 01001 (bold italics emphasis added, bold only in original)).

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by U.S. Patent No. 5,742,905 ("the Pepe Patent"). (*Id.* at 00820-21.) The PTO Examiner rejected claims 4 and 14 as obvious in view of the Pepe Patent. The PTO Examiner rejected claims 6, 7, 16, 17 and 22 as obvious in view of the Pepe Patent and U.S. Patent No. 5,430,791. (*Id.* at 823.) The PTO Examiner also rejected claims 8 and 18 as obvious in view of the Pepe Patent, U.S. Patent No. 5,430,791 and U.S. Patent No. 5,243,645. (*Id.* at 824.)

By adding the single graphical menu limitation and arguing that, unlike the prior art, the claimed "single graphical menu" must "simultaneously" show "each of" the communication services on a "single screen," the applicants clarified that the proper scope of the single graphical menu limitation and surrendered coverage of a system that uses multiple menus to display the communication options of the system. *See Sentry Protection*, 400 F.3d at 915 ("By amending their claims to include the limitation 'single unitary part' and arguing that this amendment 'distinguishes the present invention from the multi-component impact protection assembly disclosed by [the prior art],' the patentees gave up coverage of multipart impact protection components.").

Furthermore, by arguing that unlike the prior art, the present invention does not access multiple screens to modify options, the applicants ***disavowed*** coverage of any system that uses multiple screens to modify options. *See Ekchian v. Home Depot, Inc.*, 104 F.3d 1299, 1304 (Fed. Cir. 1997) ("[B]y distinguishing the claimed invention over the prior art, an applicant is indicating what the claims do not cover, he is by implication surrendering such protection."). The law is well settled that when a patentee "describes the features of the 'present invention' as a whole, this description limits the scope of the invention." *Verizon Serv. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007); *see SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.* 242 F.3d 1337, 1343 (Fed. Cir. 2001) ("[T]he characterization of the coaxial configuration as part of the 'present invention' is strong evidence that the claims should not be read to encompass the opposite structure."). Microsoft's construction, requiring the single graphical menu to display only one option for each of two services, regardless of how many options and services the subscriber has, necessarily attempts to snare coverage of a system that

uses multiple screens to display the options for each communication service of the subscriber – exactly the coverage the applicants surrendered.

c. The Specification of the O'Neal Patents Discloses a Full View Embodiment of the GUI Limitation Consistent With ALE's Construction

The specification of the O'Neal Patents includes two examples of the claimed graphical menu, as depicted in Figure 3 and Figure 4.[5] (*See* Ex. 1 ('064 Patent) at Figs. 3 and 4, 14:44-14:54.) The O'Neal patents themselves describe Figure 4 as showing a "full view" embodiment of the claimed graphical menu (*Id.* at 14:51-14:52.) Thus, ALE's proposed construction of the single graphical menu limitation is fully supported by the intrinsic evidence, and Microsoft's assertion that ALE's proposed construction of such limitation excludes preferred embodiments of the O'Neal Patents is simply wrong. Regardless, even if certain disclosed embodiments were not encompassed by ALE's construction (which is not the case), ALE's construction is still correct as a subsequent prosecution history disclaimer trumps prior description of preferred embodiments in the specification. *See, e.g., North Am. Container v. Plastipak Packaging, Inc.,* 415 F.3d 1335, 1345-46 (Fed. Cir. 2005) (interpreting the term "generally convex" as "excluding any concavity in the inner walls of the base portion, [finding that such] was required by the applicant's disclaimer during prosecution" and stating "we have previously explained that limitations may be construed to exclude a preferred embodiment if the prosecution history compels such a result"); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002) (construing claims to exclude certain preferred embodiments because the "prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was

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[5] Contrary to Microsoft's contention at the ITC hearing, ALE's construction of the single graphical menu limitation does not exclude all disclosed embodiments of the O'Neal Patents.

disclaimed during prosecution"); *Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.*, 214 F.3d 1302, 1308-09 (Fed. Cir. 2000) (adopting construction that excluded preferred embodiment "in light of the prosecution history and the unambiguous language of the amended claim").

d. A Named Inventor Confirmed That the Invention Requires All Communication Options Associated With All Communication Services To Be Displayed On One Screen

[redacted] Extrinsic evidence, such as inventor testimony, can be used "to explain how an invention works" and "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art." *Phillips*, 415 F.3d at 1318.

3. The Telephony Server Must Audibly Represent the Same Communication Options as the Single Graphical Menu

Disputed Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center" ['064 Patent: Claims 1, 3, 8, 9, 11, 20]	"Telephony server being configured to audibly represent said communication options pertaining to at least two communication services to a telephone when the subscriber employs said telephone to access the computer-implemented control center"	"a telephony server that represents the same communication options that are available through the single graphical menu"
"audibly representing said communication options to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center" ['357 Patent: Claims 1, 6]	"Audibly representing communication options pertaining to at least two communication services to a telephone using said telephony server, when a subscriber employs the telephones to access the computer-implemented control center"	"audibly representing the same options available through the graphical menu to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center"
"an audible representation of said communication options capable of being provided to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center"[6] ['357 Patent: Claim 17]	"an audible representation of communication options pertaining to at least two communication services capable of being provided to one of the telephones, using said telephony server, when a subscriber employs one of the telephones to access the computer-implemented control center"	"an audible representation of the same options available through the graphical menu to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center"

(Ex. 6 (Joint Statement (D.I. 150)) at p. 4-5.)

The telephony server limitation recites "telephony server being configured to audibly represent ***said*** communication options to said telephone." "Said communication

[6] All of these terms are discussed together unless stated otherwise.

options" in this element refers to "communication options pertaining to said plurality of communication services" recited in the preamble – the same "said communication options" recited in the single graphical menu limitation. There is only one set of communication options discussed in the claim and then that same set is referred to throughout as "said communication options." Therefore, the plain language of the claims requires both the telephony server limitation and the single graphical menu limitation to provide the ***same*** communication options.

a. The Plain Meaning of the Claim Language Requires The Same Communication Options on both User Interfaces

The telephony server limitation requires that the telephony server audibly represent the same communication options that are available through the single graphical menu. Microsoft's construction requires that the telephony server merely provide "some" of the options available via the single graphical menu and is thus contrary to the plain language of the claims.

The use of the term "said communication options" in the telephony server limitation refers back to the prior recitation of that same term in the preamble and the single graphical menu limitation. Claim 1 of the '064 Patent in relevant part is reproduced below with emphasis added to illustrate this point.

> A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize ***communication options*** **pertaining to said plurality of communication services** through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:
>
> ...
>
> a computer server coupled to exchange data with said subscriber communication profile database, **said computer server being configured to generate a single graphical menu for displaying *said communication options* for each of said communication services at the same time**, ...

> a telephony server coupled to exchange data with said communication profile database, **telephony server being configured to audibly represent *said communication options* to said telephone when said subscriber employs said telephone to access said computer-implemented control center**, said telephony server also being, configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

(Ex. 1 ('064 Patent) at 18:22-19:8 (emphasis added).)

In accord with the plain meaning of the claim language, the term "said communication options" of the telephony server limitation must mean the same as the term "said communication options" of the single graphical menu limitation and, thus, necessarily refer to the same communication options – whatever they are for a particular subscriber. Moreover, the plain language of the claims is buttressed by the axiom "that the same terms appearing in different portions of the claims should be given the same meaning" unless the intrinsic evidence compels otherwise. *Pods, Inc. v. Porta Stor, Inc.*, 484 F.3d 1359, 1366 (Fed. Cir. 2007). It is also axiomatic that modifying a claim term with the word "said" signifies that the claim term has the same meaning as its antecedent basis in the claim. *Eaton Corp. v. Rockwell International Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003). Thus, the asserted claims require that the same communication options that are visually available through the "single graphical menu" must also be audibly available through the telephony server.

b. The Specification States that the Same Options Are Available Via the Telephony Server and the Single Graphical Menu

The specification of the O'Neal Patents supports an interpretation in which "said communication options" has the same meaning in both the telephony server limitation and the single graphical menu limitation. For example, the '064 Patent specification states that it "should be apparent to those skilled in the art that the same control panel" as shown in the

graphical menus of Figures 3 and 4 "may be presented to the subscriber through the telephony server and the telephone interface if the subscriber wishes to review and/or change communication options using a telephone connected to the telephony-centric network." (Ex. 1 ('064 Patent) at 14:62-14:67.)

4. The Enable/Disable Option Limitation

Disputed Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service" ['064 Patent: Claims 1, 3, 8, 9, 11; '357 Patent: Claims 1, 6, 17]	"Communication option that controls the extent to which a communication service is implemented"	"an option that allows a subscriber to turn on or off a communication service"

(Ex. 6 (Joint Statement (D.I. 150)) at p. 4.)

The dispute with respect to the proper construction of "a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service" turns on the proper meaning of "enabling or disabling."

The plain meaning of the Enable/Disable Option limitation requires an option that allows a subscriber to turn on or off each communication service. The written specification of the O'Neal Patents utilizes the terms "enable" and "disable" consistent with their plain meaning, that is, to ***turn on or off***. (*See, e.g.*, Ex. 1 ('064 Patent) at 11:52-55, 11:62-64, 12:30-33, 13:44-47, and 14:1-5.) The ordinary dictionary meaning of "enable" is "to activate or turn on." (Ex. 10 (Microsoft Computer Dictionary) at 166.) *See Phillips*, 415 F.3d at 1322 ("Dictionaries or

comparable sources are often useful to assist in understanding the commonly understood meaning of words and have been used both by our court and the Supreme Court in claim interpretation."). Similarly, the ordinary dictionary meaning of "disable" is "to suppress something or prevent it from happening," "a method of controlling system functions by disallowing certain activities." (Ex. 10 (Microsoft Computer Dictionary) at 143.) Accordingly, the proper construction of "enabling or disabling" is ***to turn on or off***.

However, Microsoft contends that this limitation should be construed as an option that "controls the extent to which a communication service is implemented." (*See* Joint Statement (D.I. 150) at p. 4.) Aside from being unclear, Microsoft's proposed construction is inconsistent with the ordinary meaning and unsupported by the intrinsic evidence. Microsoft's proposed construction not only fails to clarify the scope and meaning of the disputed term for a jury but, rather, adds ambiguity where none otherwise exists.

5. The Unified Messaging System Limitation

Disputed Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"unified messaging system" ['064 Patent: Claims 1, 3, 8, 9, 11, 20; '357 Patent: Claims 1, 6, 17]	"System that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e., in a coordinated manner)"	"system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded to the communication devices or networks employed for the transmission of the messages"

(Ex. 6 (Joint Statement (D.I. 150)) at p. 4.)

The Unified Messaging System limitation is properly construed as a "system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded to the communication devices or networks employed for the transmission of the messages." Microsoft's proposed construction rewrites the claim inserting an

unsupported (and unexplained) new requirement, "(i.e., in a coordinated manner)," motivated not by a reasoned analysis of the intrinsic evidence but by Microsoft's desire to avoid the prior art. From this proposed construction, Microsoft contends that the Unified Messaging System limitation requires the ability to retrieve a message from the central message storage of the system after that message has already been retrieved using a different device.[7] (Ex. 11 (Beckmann Opening Report) at 13-14.) This requirement is neither suggested by the claim language, nor supported by the specification. It is something that Microsoft simply made up.

The O'Neal Patents themselves support ALE's understanding of the meaning and scope of the Unified Messaging System limitation. The '064 Patent's description of a unified messaging system is fully consistent with ALE's construction of a unified messaging system. (*See* Ex. 1 ('064 Patent) at 6:49-6:65.) Nowhere in the specification is there any discussion that the retrieval of messages in a unified messaging system must be done in a "coordinated manner." (*Id.*) Nor is there any discussion indicating that once a message is retrieved using a particular device, such message must remain on the central message store for an indefinite period so that it can be retrieved by another device. (*Id.*)

In contrast, Microsoft's construction rewrites the claim inserting an extraneous limitation, "(i.e., in a coordinated manner)," which is not supported by any intrinsic evidence and merely represents an impermissible attempt by Microsoft to read narrowing limitations into the claims in an attempt to avoid prior art. *See, e.g., Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999) (holding that if the only reasonable interpretation renders the claim invalid, then the claim should be found invalid).

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[7] As discussed in Defendants' summary judgment motion for noninfringement and invalidity of the O'Neal Patents, the prior art meets this limitation even if Microsoft's proposed construction is adopted.

C. Disputed Claim Constructions Of The '289 Patent

Microsoft asserts claims 1, 7, 8 and 10 of the '289 Patent against Defendants. There are three claim construction issues: (1) whether information received at the computer network determines ***when*** to establish telephone communication; (2) whether "activity of a user computer" means determining whether such computer is "active or idle;" and (3) whether there is a distinction between the telephone network and the computer network. Construction of these disputed terms is necessary to resolve ALE's motion for summary judgment of non-infringement and invalidity of the '289 Patent.

1. Background of the '289 Patent

According to the '289 Patent's Background of the Invention section, then-existing telephone systems routed incoming calls to voice mail when a destination telephone was busy or went unanswered. (Ex. 3 ('289 Patent) at 1:26-30.) Though an improvement over earlier systems, these systems remained problematic because they were incapable of determining when a particular callee was actually available to take a call. (*Id.* at 1:31-33.) Without the ability to determine callee availability, callers had no choice but to place a call and hope the callee answered or leave a message in an attempt to set up a time for a call. (*Id.* at 1:33-38.) Failed attempts to contact a party, and/or numerous calls back and forth with the parties leaving messages in an effort to set up a call was a waste of resources. (*Id.* at 1:38-43.)

The '289 Patent purports to solve this problem with a system that uses predetermined rules and monitored activity of the callee's computer to determine when the callee is actually available to take a call. (*Id.* at 2:7-26, 14:50-15:7, and 15:35-46.) In the system described in the '289 Patent, the monitored computer activity and predetermined rules of both the caller and callee are used to set up a call between the parties by generating ring tones to each party when they are both available to take a call. (*Id.* at 15:14-24 and Fig. 9.) The activity of the

called party's computer is monitored in order to determine that the called party is physically near the phone associated with that computer and therefore more likely available to take a call. The specification equates "activity of a user computer" with determining whether such computer is "active or idle." (*See, e.g., id.* at Abstract.)

2. Construction of "receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party"

Disputed Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party" [Claims 1, 7]	*Phrase does not require construction.* *If construction is required:* "receiving at the computer network information from the telephone network that a telephone call from a first party to a second party has been initiated"	"receiving at the computer network an indication from the telephone network that a first party requests to set up a telephone call with a second party prior to the time the call is placed by the first party"

(Ex. 6 (Joint Statement (D.I. 150)) at 3.)

ALE's proposed construction is fully supported by the intrinsic evidence. *See Vitronics*, 90 F.3d at 1582 (in construing claims, a court should look to intrinsic evidence consisting of the language of the claims, the specification and the prosecution history as it "is the most significant source of the legally operative meaning of disputed claim language"); *see also Bell Atl. Network Servs., Inc. v. Covad Comm. Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005), cert denied, 546 U.S. 1170 (2006) ("*Phillips*") (*citing Vitronics*, 90 F.3d at 1582) (claims themselves "provide substantial guidance as to the meaning of particular claim terms"). Microsoft's initial position that a construction is not required, ignores the recent precedent from the Federal Circuit finding that disputed claim terms must be construed. *See O2 Micro Intl Ltd. v. Beyond Innovation Tech. Co., et al*, No. 07-1302, 2008 U.S. App. LEXIS 7053, at *18-27 (Fed. Cir. April 3, 2008)

(confirming that disputed claim terms must be construed). Microsoft's fall-back construction ignores the plain language of the claim by rewriting "desires to establish telephone communication" to "has been initiated" and disregards the teaching of the specification underscoring that the entire purpose of the claimed invention is to eliminate the need to place calls in the hope that a called party will be available.

The '289 Patent is directed to the problem of avoiding the "undesirable activity" and "inefficien[cy]" of making "multiple calls" and "repeated or failed attempts to actually reach a callee." (Ex. 3 ('289 Patent) at 1:37-43) The Background of the Invention section acknowledges that prior to the invention of the '289 Patent the "caller has no choice but to place a call to the destination telephone and hope that the callee answers." (*Id.* at 1:33-35.) The '289 Patent purports to solve the problem by providing an apparatus and method for the caller to indicate to the system that he or she desires to talk to the called party and the system, using predetermined rules and monitored activity of the callee's computer, will determine when the callee is actually available to take a call and set up the call once the parties are available. (*Id.* at 2:18-26.) *See Phillips*, 415 F. 3d at 1316, *quoting Renishaw PLC v. Marposs Societá Per Azion,* 158 F.3d 1243, 1250 (Fed. Cir. 1998) ("Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim.").

The '289 Patent provides:

> In step 252, the caller indicates a desire to establish a telephone communication link with the callee. ***In a conventional communication system, the caller picks up the originating telephone and dials the telephone number*** for the destination telephone 104. However, ***in accordance with this aspect of the system 100, the caller may indicate the desire to establish a telecommunication link using the caller computer 184 and placing the callee telephone number … on a call list****….*

(Ex. 3 ('289 Patent) at 16:23-33.)

The '289 Patent further describes that the invention calls back both parties when both parties are available, after the caller has indicated that he or she desires to establish a telephone connection with the called party.

> In operation, ***the system allows a caller to indicate a desire to establish a telephone communication link with a specified callee***. The caller can use the originating telephone 102 or the caller computer 184 to initiate the call processing by the system 100. The system 100 monitors the caller and callee activities and call processing rules and, when appropriate for both parties, establishes a telephone communication link by sending signals from the central office switch 116 to the originating telephone to generate a ring signal. The central office switch 116 also generates appropriate signals to generate ring signal at the destination telephone 104.

(*Id.* at 15:14-24 and 2:18-24 ("***The caller indicates a desire to establish a communication link with the callee***....The call processing criteria for both the caller and callee are analyzed and when all conditions are met, a telephone communication link is established....")).

Based on this purpose and function of the '289 Patent, the computer network must receive information, ***prior to any telephone call being placed***, that a party requests to set up a telephone call with the other party ***at a time*** when the other party is available. By requesting to set up a call when both parties are available, rather than placing a call without knowing whether the called party is available (thereby being left at the mercy of the unknown availability of the callee), the '289 Patent purports to avoid a waste of resources in the form of repeated messages and unsuccessful call attempts. (*Id.* at 2:58-3:9, 14:50-15.7, 15:13-24, and 15:35-46.) Hence, claim 1 specifically denotes that it is a "method of determining ***when*** to establish telephone communication between two parties" which "us[es] the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party." (*Id.* at 18:40-41 and 62-65.)

For at least these reasons, ALE's construction "receiving at the computer network an indication from the telephone network that a first party requests to set up a telephone call with a second party prior to the time the call is placed by the first party" is correct in view of the clearly stated objective in the patent specification. *See, e.g., Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1348 (Fed. Cir. 2004).

3. "[A]ctivity of a user computer" means "active or idle"

Disputed Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"monitoring activity of a user computer" [Claims 1, 7]	*Phrase does not require construction.* *If construction is required:* "monitoring the status of a user computer"	"determining whether a called party's computer is active or idle"

(Ex. 6 (Joint Statement (D.I. 150)) at 3.)

Claims 1 and 7 set out two distinct inputs to the predetermined rules at the computer network – ***both*** of which must be satisfied. First, the claims require the pre-determined rules to process information about the call being originated by the caller. (Ex. 3 ('289 Patent) at 18:52:54 and 19:39-41.) Second, the claims require the predetermined rules to process information regarding the monitored activity of the callee's computer (i.e., whether the callee's computer is active or idle, indicating physical proximity to the computer-associated phone at a particular moment (*see, e.g., id.* at 14:50-15:13, and 17:5-25)) to determine when the callee is available to take the call. (*Id.* at 18:48-51 and 19:36-38.)

a. The patent explains that using computer activity to determine a user is physically near the telephone and available for a call is important to solving a perceived problem of the prior art

Determining when a user is actually available to take a call is central to the problem the '289 Patent was trying to solve. (*See, e.g., id.* at 1:31-46; 2:7-26; 2:58-3:9, 14:50-15.7, 15:13-24, and 15:35-46.) Using the information concerning the monitored activity of the

user computer in conjunction with the user-selected call criteria is the method by which the claimed system avoids the purported problems of the prior art that required a caller to simply dial and hope a called party was available to take a call. (*Id.* at 2:7-26.) The claimed system of the '289 Patent uses monitored computer activity of the callee to help determine if the user is available to take a call. (*Id.* at 2:15-18.) When a user is actively providing inputs to his or her computer (such as typing on a keyboard or moving his mouse), that is a good indication that such user is physically near the phone and available to take a call. (*Id.* at 14:33-43.)

b. The specification equates monitoring user computer activity with determining whether the computer is active or idle

The '289 Patent uniformly describes "monitoring the activity of a user computer" as observing whether the user's computer is active or idle. (*Id.* at Abstract, 2:15-18, 14:33-43, 14:50-15:11, 15:35-42, 15:56-59, and 16:3-7.)[8] For example, the Abstract states that a "user's ***computer activity may also be monitored and the computer status as idle or active*** may be reported to the computer network as part of the call processing criteria." (*Id.* at Abstract.) The "Summary of the Invention" section similarly provides that the called party's "***computer activity***

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[8] In certain of these cited passages, the specification defines the subject claim limitation as determining whether the computer is active or idle. (*See, e.g.*, '289 at 15:35-42 ("the status of the computer (***i.e., idle or active***)"), 15:56-59 ("the use of the status (***i.e., idle or active***) of the caller computer"), 16:3-7 ("the use of computer status monitoring (***i.e., idle or active***) for the callee computer").) Use of the phrase "i.e." in the specification signals that "the patentee has chosen to be his own lexicographer." *Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1327, 1330 (Fed. Cir. 2003). "In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. Before the ITC, Microsoft pointed to two instances in which "e.g." is used instead of "i.e." to connect "idle or active" to "status." (*See* Ex. 12 (Microsoft Post-Hearing Br.) at p. 34 (citing '289 at 16:18-19, 17:59-62).) Microsoft suggested that this implies that the construction of "activity" must be broader than "active or idle." This argument is a strawman. Microsoft has not and cannot point to any intrinsic evidence supporting its assertion that a user computer can be anything other than "idle or active" for purposes of the monitoring limitation of the '289 patent. The one purported example Microsoft provides (*id.* at p. 35) fails because it refers to the status of the user, not the user computer, and the '289 Patent refers to the activity of the ***user computer***, not the ***user***.

may be monitored and the status of the computer as idle or active may be reported to the computer network." (*Id.* at 2:15-18.) Such statements in the Abstract and Summary of the Invention "are not limited to describing a preferred embodiment, but more broadly describe the overall invention[] of [the] patent[]." *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1348 (Fed. Cir. 2004); *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 864 (Fed. Cir. 2004) (relying on the Summary of the Invention to construe a term and explaining that "certain sections of the specification are more likely to contain statements that support a limiting definition of a claim term than other sections").

In addition to the Abstract and Summary of the Invention, the "Detailed Description of the Invention" section of the '289 Patent defines "monitoring the activity of a user computer" as observing whether the computer is active or idle. For example, the '289 Patent states:

> The computer operating system ... is capable of monitoring user activity on the computer. For example, the operating system on the callee computer 154 can ***detect user activity on the keyboard* 154*a* *or the mouse* 154*b***. By monitoring this activity, the operating system can determine a user's status and activate certain software programs, such as screen saver, when no user activity has been detected for a certain period of time. Under these circumstances, the operating system may determine that the callee computer 154 has entered an ***"idle"*** state.

(Ex. 3 ('289 Patent) at 14:33-43.) The '289 Patent also states that:

> [T]he system 100 must be aware of an association between the telephone and the computer. This is particularly important ***if the status of the computer (i.e., idle or active)*** is used as one of the call processing criteria. The system 100 can monitor the activity of a computer (e.g., the callee computer 154) in order to establish a telephone communication link with an associated telephone (e.g., the destination telephone 104).

(*Id.* at 15:35-42.)

The '289 Patent uses this definitional language in other places as well. (*Id.* at 17:22-25 (discussing "the change in the state of the caller computer ***from the idle state to the active state*** and interpret that as an indication that the caller is now available for a telephone call."), 15:56-59 (discussing "the ***use of the status (i.e., idle or active) of the caller computer***"), and 16:3-7 (discussing "the ***use of computer status monitoring (i.e., idle or active) for the callee computer***").) Use of the phrase "i.e." in the specification signals that "the patentee has chosen to be his own lexicographer." *Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1327, 1330 (Fed. Cir. 2003). "In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. The "Detailed Description of the Invention" section also explains how monitoring the activity of a user computer to determine whether the computer is active or idle is used to achieve the central purpose of the claimed invention – determining *when* a user is available to take a call:

> The system 100 can monitor computer activity and generate signals to both the originating telephone 102 and the destination telephone 104 when the callee computer 154 and the caller computer 184 are not in the ***idle*** state. The fact that both computers are not in the idle state indicates that the users of each respective computer may be available for a telephone conversation.

(Ex. 3 ('289 Patent) at 14:50-56.)

The specification goes on to explain how this information concerning the monitored activity of the user computer as active or idle is used along with the call processing rules to determine that a user is in fact available to take a call:

> In addition, the system 100 can apply call processing rules that may also govern operation of the telephone portion of the system 100. For example, the callee computer 154 ***may be in an "active" state (as opposed to the idle state)*** but the user has indicated that he should not be disturbed at the present time. Thus, the central office switch 116 or the call processor 176 accesses the affiliation list 150 for the destination telephone 104 to determine the callee-selected call processing criteria. In addition, the central office switch 116 or the call processor 176 can access the affiliation list 150 for the caller and apply any caller-selected call processing rules. For example, the ***caller***

> ***computer 184 may be in the active state***, but the caller status in the affiliation list 150 may indicate that the caller is in a meeting and is, therefore, unavailable for a telephone call with the callee. In this manner, the system 100 can monitor computer activity and determine when the caller and callee may both be available for a telephone call and further applies call processing criteria for both the caller and callee.

(*Id.* at 14:56-15:11.)

4. Constructions of "telephone network" and "computer network"

Disputed Claim Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"telephone network" [Claims 1, 7]	"network for carrying telephony information"	"network for carrying telephony information originated by telephones"
"computer network" [Claims 1, 7]	"network for carrying digital data"	"network for carrying digital data originated by computers"

(Ex. 6 (Joint Statement (D.I. 150)) at 3.)

Microsoft took the position in the ITC Hearing that data can simultaneously be on both networks, the telephone network and the computer network. (Ex. 12, (Microsoft Post-Hrg Br.) at p. 78.) This construction, however, obliterates the distinction between the telephone network and the computer network. If the same data were simultaneously on both the computer and telephony networks, the networks would be one and the same, at least at certain points in time. Hence, data are either computer data on the computer network or telephony data on the telephony network, but not both. Defendants' proposed construction preserves the distinction of the computer and telephone networks by construing these terms to include the origin of the data, which then is carried on the telephone network (for telephony information) or computer network (for other digital data).

D. Disputed Claim Constructions Of The '439 Patent

Microsoft asserts claims 1, 2, 9, 21, 24, 28, 36, 38, 43, and 48 of the '439 Patent and claims 1, 2, 21, 28, 38, and 43 of the '439 Patent against Alcatel and Genesys, respectively. The parties have narrowed the claim construction disputes with respect to the '439 Patent to two issues. The first issue is whether filtering the incoming call "according to current activity of the user on the computer network" requires filtering based on whether the user is present or logged in on the network or, alternatively, requires filtering based on the user's computer's "status" – filtering based on stored criteria such as time of day that are independent of and have no connection to the user's activity on the network. The second issue is the distinction between the "telephone network" and the "computer network."

1. Background of the '439 Patent

a. The Inventor Believed Existing Call Processing Capabilities, Such As Voice Mail and Call Forwarding Were Insufficient

The background of the '439 Patent recognized that then-existing telephone services included a "wide range of options, such as voice mail, caller identification, call waiting, call forwarding, three-way calling and the like." (Ex. 4 ('439 Patent) at 1:18-20.) The '439 Patent further recognized that a "conventional central office switch provides the ability to divert calls based on certain call conditions, such as 'Call Forward No Answer,' which may be used to divert an incoming call to voicemail, or 'Call Forward Busy,' which may also divert the incoming call to voicemail." (*Id.* at 11:4-9.)

The '439 Patent described these options as insufficient because "the user is still limited in determining with whom the user wishes to speak and when the user wishes to speak with certain parties or, at the user's option, not speak with certain parties." (*Id.* at 1:23-35.)

b. The Inventor Sought to Provide a Way to Control Calls Based Upon Current Activity of Callers on the Computer Network

The '439 Patent is generally directed to a "system and method to control incoming calls to a user's telephone." (*Id.* at 1:37-38.) The '439 Patent seeks to control incoming calls to a called party's telephone by allowing the called party to specify call processing criteria ("user-selectable criteria") that are stored on a computer network and accessible by the telephone network. (*Id.* at Abstract and 1:44-50.) The system includes an "affiliation list" that is stored on a computer network and that contains the user-selectable criteria for processing incoming calls. (*Id.* at Abstract, 1:44-50, 2:66-3:4 and 6:23-28.) The user-selectable criteria stored in the affiliation lists may specify that the called party accepts all incoming calls, no incoming calls or only incoming calls from certain parties, and may also include call processing rules that vary based on factors such as the time of day. (*Id.* at Abstract and 1:65-2:1.) In addition to processing incoming calls based on rules relating to the identification of the calling party and the time of day, the claims of the '439 Patent require that some of the one or more affiliation lists be used to filter incoming calls based on the current activity of subscribers on the computer network or according to current activity of the user on the computer network. (*Id.* at 14:18-26.)

2. Construction of "current activity of subscribers on the computer network or according to current activity of the user on the computer network"

Disputed Claim Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"current activity of subscribers on the computer network or according to current activity of the user on the computer network" [Claims 1, 21, 28, and 38]	"current status of subscribers on the computer network or according to current status of the user on the computer network"	"whether the calling party is present on the computer network or the called party is present on the computer network"

(Ex. 6 (Joint Statement (D.I. 150)) at 2.)

The central issue is whether the ability of the system to process incoming calls according to "current activity of the user on the computer network" simply requires processing calls based upon user-selected criteria (rules) that are stored on a computer, or whether those rules require processing calls according to the user's current activity on a computer network. The plain language of the asserted claims requires the latter. Other elements of the asserted claims already require the user-selected criteria to be stored in a data structure on the computer network. Consequently, Microsoft's construction of the subject phrase would render it improperly superfluous.

In contrast, ALE's proposed construction recognizes that the asserted claims additionally require criteria for processing incoming calls according to a user's current activity on the computer network. In fact, it was this "current activity of the user on the computer network" limitation that was added to the asserted claims during the prosecution of the '439 Patent in order to overcome a prior art rejection. Indeed, as originally submitted, the claims required only that the user-selected criteria be stored in lists on the computer network – as Microsoft would have the Court construe the issued claims. However, those claims were

rejected by the examiner because the prior art disclosed call processing rules based on user-selected criteria stored on a computer. As a result, the applicant amended the claims to require call processing rules based on "current ***activity*** of the user on the computer network." Microsoft's proposed construction impermissibly reads this limitation out of the claim, and thus attempts to recapture the claim scope the applicant surrendered during the prosecution of the '439 Patent.

a. The Claim Language Supports ALE's Construction

For purposes of the asserted claims of the '439 Patent, there are two types of "user-selectable criteria for call processing." There are those "user-selectable criteria" that filter an incoming call "according to current activity of users [or subscribers] on the computer network" and there are user-selectable criteria that are not related to the user's activity on the network. (Ex. 4 ('439 Patent) at 16:4-11.) According to the claims, both criteria are stored with associated caller lists in the form of a data structure on a computer network. (*Id.*) Therefore, the place where these two types of user selectable criteria are stored is not a basis for distinguishing between the two. The only basis for distinguishing between them is that those criteria which filter incoming calls "according to current activity of users (or subscribers) on the computer network" vary in their result according to ***current activity on the computer network*** of either the calling party or the called party, while the other type of criteria do not.

An example of a user-selectable criterion that filters incoming calls according to current activity on the computer network of the user or subscriber (called or calling party) is a call processing rule that allows calls from a list of callers to ring through to an office phone of a called party ***when the called party is logged into his office computer network***, but diverts those calls directly to voicemail ***when that same called party is not logged onto the office computer***

network. Such a rule has a result that is dependent upon the current activity of the called party on the office computer network (*i.e.,* presently logged on, or not logged on, such network).

An example of the second type of user-selectable criteria is a call processing rule that allows calls from a list of callers to ring through to an office extension between the hours of 9 AM and 5 PM, but diverts those calls immediately to voicemail during all other times. Like the previous type of user-selectable criteria, the second type can have conditional results. ***But, unlike the first type, those results are not conditioned upon the current activity of the called party on the computer network***. Rather, the results are conditioned upon the time of day. Another example of the second type of user-selectable criteria is a call processing rule that diverts all incoming calls directly to voicemail when it is activated (often referred to as "do not disturb"). In this example, the result of the rule is not conditional. It is simply an on/off switch that diverts calls to voicemail when turned on. The common characteristic of both examples of this second type of user-selectable criteria is that the result of the application of the criteria is ***not*** conditioned according to the current activity of the user (or subscriber) on the computer network.

The claimed "data structure" of the asserted claims of the '439 Patent ***may*** contain both types of user-selectable criteria, but it ***must*** contain at least one criterion associated with a caller list that filters incoming calls ***according to the current activity of the called or calling party on the computer network.*** Microsoft's proposed construction impermissibly writes this requirement out of the claims.

b. The '439 Patent Prosecution History Demonstrates That The Asserted Claims Of The '439 Patent Require Processing Calls Based On "Activity" Not User Defined "Status" Rules Stored on a Computer Network

Original claim 1 of the '439 Patent did not include the requirement that calls be filtered "according to current activity of the user on the computer network." Rather, it merely

required filtering a call based on "user-selectable criteria" that were stored in a data structure in a computer network. Original claim 1 reads, in relevant part:

> "a ***data structure contained within a computer network to store user-selectable criteria ...*** the controller accessing the data structure via the computer network access port and thereby applying the ***user-selectable criteria*** to the incoming call.

(Ex. 13 ('439 Patent Prosecution History) at MSAL 00697 (emphasis added).)

(1) The Prior Art Disclosed Processing Incoming Calls Based On Status

The examiner rejected original claim 1 as anticipated by U.S. Patent No. 5,329,578 ("the Brennan Patent"), stating that "Brennan teaches a system, method, and a computer readable medium for user specification of call processing in a telephone network ... ***to process the incoming call in accordance with the user-selectable criteria*** (column 3, line 54 through column 4, line 18) ..." (*Id.* at MSAL 00633.) And in fact, the Brennan Patent discloses almost the exact same user-selectable criteria for call processing described in the '439 Patent as "***conditional status***."

Call processing criteria disclosed in the prior art (Brennan Patent):

> "***Some subscribers may wish to change, at regular intervals, the way their calls are managed, e.g. only emergency calls after 11 p.m. weekdays and after midnight on weekends.*** ... Multiple time slots can be specified, e.g. Monday-Friday 0900-1700 hours, Saturday 1030-2330 hours, and "other" which defines what happens for non-specified time slots. ***For each of these predefined time slots, the Schedule can list the default devices to use in contacting the subscriber during that time***, e.g. Monday-Friday 0730-0800 hours use car or home number, Monday-Friday 0800-0830 hours use car or office number. ... Similarly, ***the Schedule allows each slot to have an urgency of calls which the subscriber will accept, e.g. only urgent calls*** after 5 p.m. on weeknights and on weekends."

(*Id.* at MSAL 00615 (quoting Brennan Patent at 6:48-7:2) (emphasis added).)

"Conditional status" criteria disclosed in the '439 Patent specification:

> "Furthermore, the user may attach conditional status to individual callers or to calling lists. ***Conditional status may be based on factors, such as the time of day, current availability of the user, work status, or the like. For example, the user may accept calls from certain work parties during specified periods of the day (e.g., 9:00 am – 11:00 a.m.)***, block calls from selected calling parties during other periods of time (e.g., 12:00 – 1:00 p.m.), or ***allow calls during a business meeting only from certain calling parties (e.g., the boss)***. These conditional status criteria maybe applied to individuals or to one or more lists in the affiliation 150."

(Ex. 4 ('439 Patent) at 9:45-55 (emphasis added).) As discussed in the '439 Patent prosecution history, routing calls solely according to the "conditional status" criteria disclosed in the '439 Patent is anticipated by the Brennan Patent.

(2) The Applicant Amended The Claims To Additionally Require Filtering Calls According To "Current Activity Of The User On The Computer Network"

In response to the examiner's rejection, the applicant amended the claims and argued that in his invention, the filtering of calls changes according to the "current activity of a user on the computer network." With respect to the Brennan Patent, the applicants stated:

> With regard to Figures 2a-2g, Brennan teaches that the flow of information is fixed and is not dependent on any particular status or activity of the user or of the caller and that the flow of information is determined by the user's requirements for that particular caller.
> Thus, the treatment of an incoming call [in Brennan] is dependent on a caller list that does not change. ***More specifically, actions or activity of callers on a telephone network or on a computer network have no effect on the caller list or other user requirements for callers.***
>
> ***
>
> In contrast to Brennan, claim 1 as amended recites that the one or more lists used in filtering an incoming call change according to current activity of the subscribers (i.e., persons making the calls), or according to the current activity of the user (e.g., intended recipient of the call). In one example, the current activity of the subscriber and or the user usually occurs on a computer network. ***The ability to process an incoming call on a telephone network according to activity on a computer network is not taught or suggested by Brennan.***

(Ex. 13 ('439 Patent Prosecution History) at MSAL 00694-695 (emphasis added).)

The result of this narrowing amendment was that the applicant surrendered coverage of a system that filtered calls based only on user-selectable criteria, such as blocking all calls or blocking certain calls at certain times, that did not process an incoming call according to current user activity of a computer network. The Federal Circuit has determined that the language of the claims and the statements in the prosecution history trump any description in the specification, because they come later in time. *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1327 (Fed. Cir. 2002). In fact, it is clear from the prosecution history that the applicant attempted to gain coverage of call processing based merely on user "status" stored on a computer network. However, the applicant was not successful in securing such coverage and added the limitation requiring user-selectable criteria that filtered calls "according to current activity of the user on the computer network."

c. Microsoft's Proposed Claim Construction Impermissibly Attempts To Recapture The Original Scope of Claim 1 By Replacing "Activity" with "Status"

By replacing "***computer network activity***" with "***user status***," Microsoft's proposed claim construction impermissibly attempts to recapture the claim scope the applicant intentionally surrendered during prosecution to overcome a prior art reference.[9] This attempt runs contrary to the law. *Ekchian v. Home Depot, Inc.*, 104 F.3d 1299, 1304 (Fed. Cir. 1997)

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[9] ALE agreed to a construction in the ITC that construed "current activity of a user on the computer network" to mean "current status of a user on the computer network" but during the ITC hearing Microsoft argued an interpretation of the agreed construction that eliminates computer network activity completely. Specifically, Microsoft argued in the ITC that user defined status rules such as routing calls based upon time of day or a rule that sent all calls to voicemail (do not disturb) satisfied the agreed construction. (Ex. 12 (Microsoft Post-Hrg Br.) at p. 57.) Consequently, ALE's construction clarifies that ambiguity to avoid similar issues here.

("[B]y distinguishing the claimed invention over the prior art, an applicant is indicating what the claims do not cover, he is by implication surrendering such protection.").

The '439 Patent specification discloses processing calls based on "***conditional status***" of the user where the result does not actually depend upon a user's current activity on a computer network. This is described in the '439 Patent specification as follows:

> "Furthermore, the user may attach conditional status to individual callers or to calling lists. Conditional status may be based on factors, such as the time of day, current availability of the user, work status, or the like. For example, the user may accept calls from certain work parties during specified periods of the day (e.g., 9:00 am – 11:00 a.m.), block calls from selected calling parties during other periods of time (e.g., 12:00 – 1:00 p.m.), or allow calls during a business meeting only from certain calling parties (e.g., the boss). These conditional status criteria maybe applied to individuals or to one or more lists in the affiliation 150."

(Ex. 4 ('439 Patent) at 9:45-55.) However, none of these "user-selectable criteria" that indicate "conditional status" meet the claim limitation disclosed in the asserted claims requiring processing calls "according to current activity of the user on the computer network" because none of these processing rules have anything to do with the current ***activity*** of the user ***on the computer network***. Rather, they are conditioned upon (1) time of day, (2) user's attendance of a meeting, and (3) the identity of the caller. These are all irrespective of any user activity on a computer network, and thus, are not examples of the claimed limitation.

d. Microsoft's Proposed Construction Makes the Claim Limitation Superfluous

To the extent that Microsoft's proposed construction and application of the claim limitation suggests that routing rules stored on the computer network satisfies the "current activity" limitation, Microsoft is rendering the "current activity" limitation added during the prosecution of the '439 Patent superfluous. The structure of the asserted claims themselves

dictates that all of the "user-selectable criteria" (of which "current activity of the user on the computer network" is a required subset) must be stored on the computer:

> a data structure contained within a computer network to store user-selectable criteria for call processing, *wherein the data structure stores the user-selectable criteria in one or more lists* that are used in filtering an incoming call and ***wherein some of the one or more lists are used to filter the incoming call*** according to current activity of subscribers on the computer network or *according to current activity of the user on the computer network.*

(Ex. 4 ('439 Patent) at 14:18-26 (emphasis added).) Hence, (1) the claimed data structure stores user-selectable criteria in one or more lists that are used to filter incoming calls; and (2) some of the one or more lists which contain the user-selectable criteria must filter calls according to current activity of the user on the computer network. (*Id.*) Put another way, the claim limitation requires that ***all*** of the user-selected criteria lists be ***stored on*** the computer network, and further requires that some of those rules filter calls according to the "current activity of the user on the computer network." If "current activity of the user on the computer network" were construed to mean "rules stored on the computer network," (as Microsoft contends) then the claim limitation would require "user-selected criteria stored on the computer network wherein some of the one or more criteria are used to filter the incoming call according to criteria stored on the computer network." This construction makes no sense. A claim construction that does not give effect to all limitations of the claims cannot be correct. *Flex-Rest, LLC v. Steelcase, Inc.*, 455 F.3d 1351, 1361 (Fed. Cir. 2006). Microsoft's construction thus runs counter to the claim language itself.

e. ALE's Proposed Claim Construction Is Supported By The Intrinsic Evidence

Under ALE's proposed construction, filtering a telephone call is done based on whether a user is present on the computer network, such as whether a user is logged into an Internet instant messaging program. The '439 Patent specification confirms that the disputed

claim language requires filtering based on whether the user is present on the computer network. The '439 Patent explains that the Internet is "a vast multi-computer network coupled together by data links having various communication speeds." (Ex. 4 ('439 Patent) at 5:27-29.) The '439 Patent then explains that the invention includes "the forward list 160 [that] contains a list of Internet subscribers whose ***Internet activity a user wishes to monitor***. This list is sometimes referred to as a 'buddy' list." (*Id.* at 7:61-63.) The '439 Patent provides:

> "[T]he Internet controller 152 accesses the forward list 160 ... to determine which Internet subscribers contained within the forward list are ***currently active on the Internet 134***. In conventional Internet operation, the Internet controller 152 sends a message to the user computer 154 indicating which Internet subscribers on the forward list 160 are ***currently active on the Internet 134***."

(*Id.* at 7:64-8:1.) As discussed earlier, during prosecution of the '439 Patent, the applicant added the "current activity" limitation to distinguish the claimed invention from the Brennan Patent. The only type of computer activity discussed in the '439 Patent is the Internet controller monitoring the activity of a user when they use a computer to access the Internet. In this context, the '439 Patent discusses monitoring whether a particular user is ***present*** "on the Internet" in accord with ALE's proposed construction.

3. Constructions of "telephone network" and "computer network" constructions.

Disputed Claim Term	Microsoft's Proposed Construction	ALE's Proposed Construction
"telephone network" [Claims 1, 21, 28, 38]	"network for carrying telephony information"	"network for carrying telephony information originated by telephones"
"computer network" [Claims 1, 21, 28, 38]	"network for carrying digital data"	"network for carrying digital data originated by computers"

See section IV. C.2.4 discussing the "telephone network" and "computer network" constructions.

CONCLUSION

For the foregoing reasons, Defendants ALE and Genesys respectfully request that the Court adopt Defendants' claim constructions.

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May 9, 2008

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EXHIBIT 1

US006263064B1

(12) **United States Patent**
O'Neal et al.

(10) **Patent No.: US 6,263,064 B1**
(45) **Date of Patent: *Jul. 17, 2001**

(54) **CENTRALIZED COMMUNICATION CONTROL CENTER FOR VISUALLY AND AUDIBLY UPDATING COMMUNICATION OPTIONS ASSOCIATED WITH COMMUNICATION SERVICES OF A UNIFIED MESSAGING SYSTEM AND METHODS THEREFOR**

(75) Inventors: **Stephen C. O'Neal**, San Francisco; **John Jiang**, Danville, both of CA (US)

(73) Assignee: **International ThinkLink Corporation**, San Francisco, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/239,585**

(22) Filed: **Jan. 29, 1999**

(51) **Int. Cl.**[7] **H04M 3/42**

(52) **U.S. Cl.** **379/201**; 379/88.16; 379/212; 370/352

(58) **Field of Search** 379/88.12, 88.13, 379/88.14, 88.15, 88.16, 88.17, 88.22, 88.23, 88.24, 88.25, 88.27, 88.28, 90.01, 201, 210, 211, 212, 230; 370/351, 352, 353, 354

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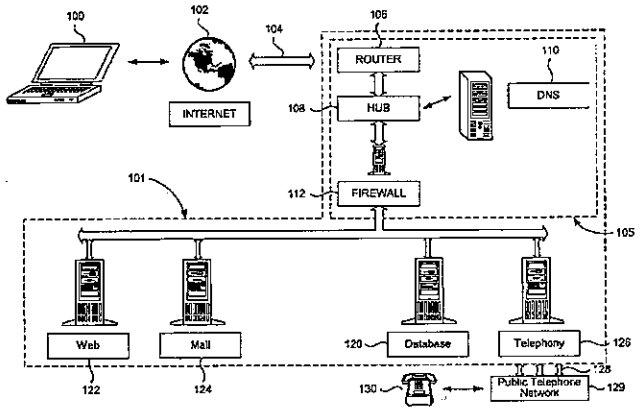
Primary Examiner—Scott L. Weaver
Assistant Examiner—Roland G. Foster
(74) *Attorney, Agent, or Firm*—Beyer Weaver & Thomas, LLP

(57) **ABSTRACT**

A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal is disclosed. The computer implemented control center includes a subscriber communication profile database having therein an account pertaining to the subscriber. The account includes the communication options for the subscriber. The communication options include parameters associated with individual ones of the communication services and routings among the communication services. There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on the display terminal when the subscriber employs the display terminal to access the computer-implemented control center through the data-centric network. The computer server is also configured to receive from the subscriber via the display terminal a first change to the communication options and to update the first change to the account in the subscriber communication profile database. There is also included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to the telephone when the subscriber employs the telephone to access the computer-implemented control center. The telephony server is also configured to receive from the subscriber via the telephone a second change to the communication options and to update the second change to the account in the subscriber communication profile database.

20 Claims, 6 Drawing Sheets



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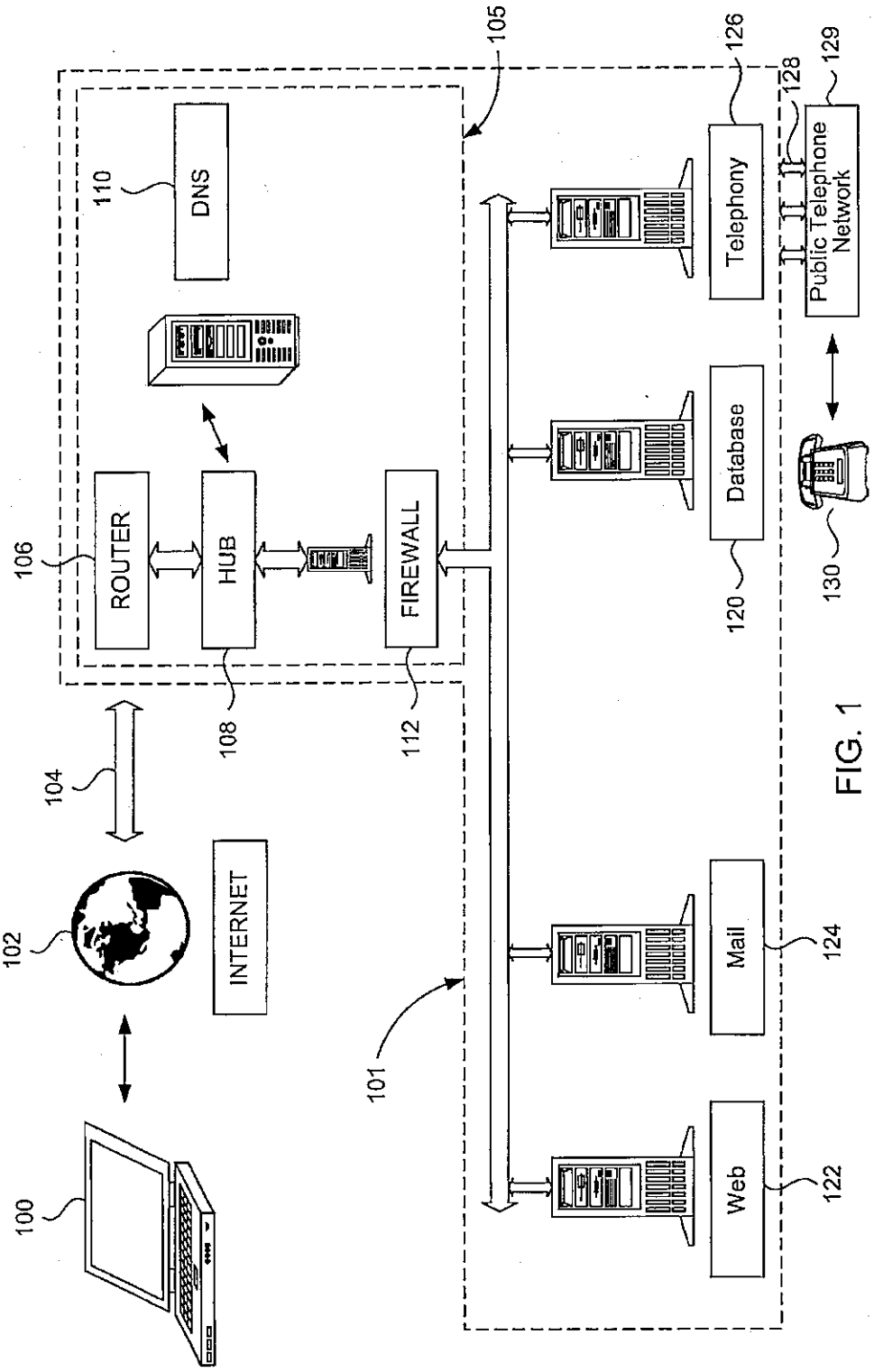
105
126
128
129
110
DNS
Telephony
Public Telephone Network
ROUTER
HUB
FIREWALL
Database
106
108
112
120
130
104
INTERNET
102
101
Mail
124
Web
122
100

FIG. 1

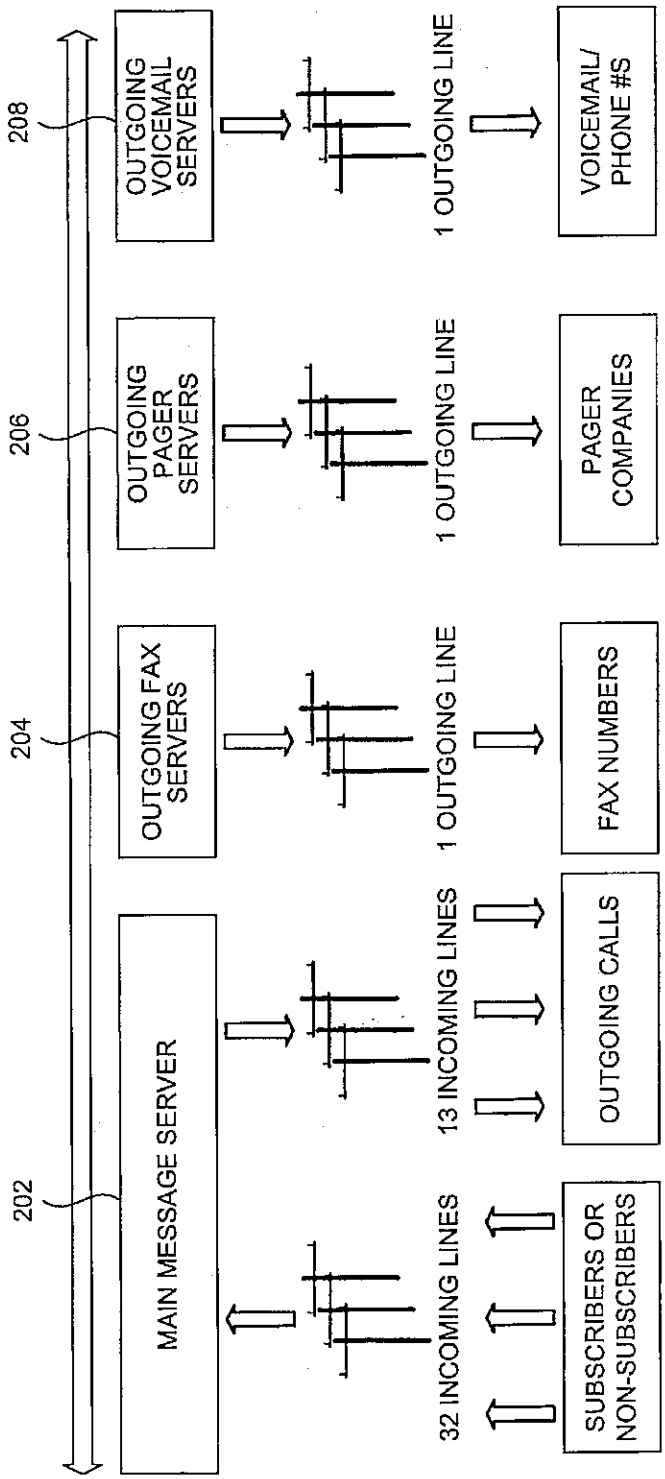
208
206
204
202
OUTGOING VOICEMAIL SERVERS
OUTGOING PAGER SERVERS
OUTGOING FAX SERVERS
MAIN MESSAGE SERVER
1 OUTGOING LINE
1 OUTGOING LINE
1 OUTGOING LINE
13 INCOMING LINES
32 INCOMING LINES
VOICEMAIL/ PHONE #S
PAGER COMPANIES
FAX NUMBERS
OUTGOING CALLS
SUBSCRIBERS OR NON-SUBSCRIBERS

FIG. 2

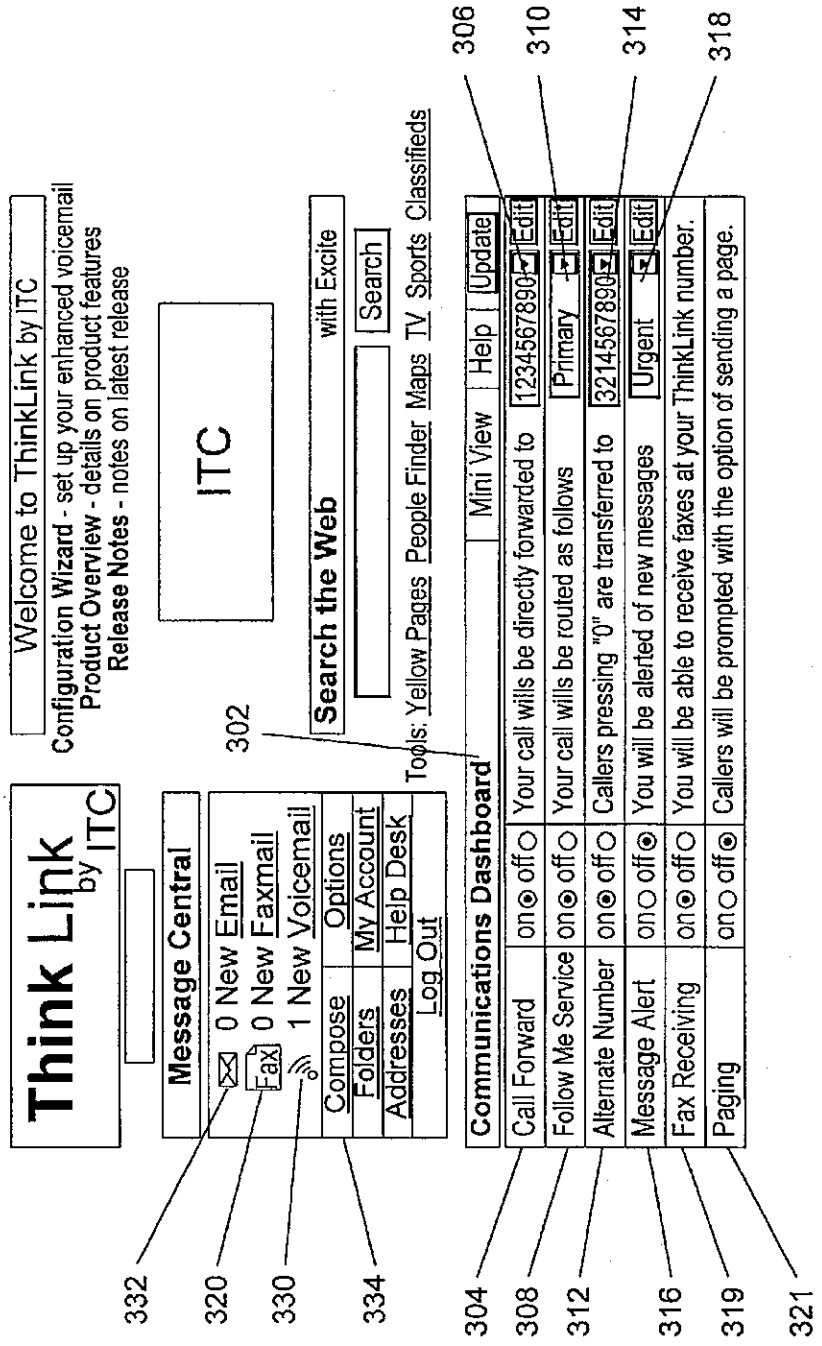
Think Link by ITC
Welcome to ThinkLink by ITC
Configuration Wizard - set up your enhanced voicemail
Product Overview - details on product features
Release Notes - notes on latest release
ITC
Search the Web with Excite
Search
Tools: Yellow Pages People Finder Maps TV Sports Classifieds
Message Central
0 New Email
0 New Faxmail
1 New Voicemail
Compose Options
Folders My Account
Addresses Help Desk
Log Out
Communications Dashboard
Mini View Help Update
Call Forward on off Your call wills be directly forwarded to 1234567890 Edit
Follow Me Service on off Your call wills be routed as follows Primary Edit
Alternate Number on off Callers pressing "0" are transferred to 3214567890 Edit
Message Alert on off You will be alerted of new messages Urgent Edit
Fax Receiving on off You will be able to receive faxes at your ThinkLink number.
Paging on off Callers will be prompted with the option of sending a page.
302
306
310
314
318
332
320
330
334
304
308
312
316
319
321

FIG. 3

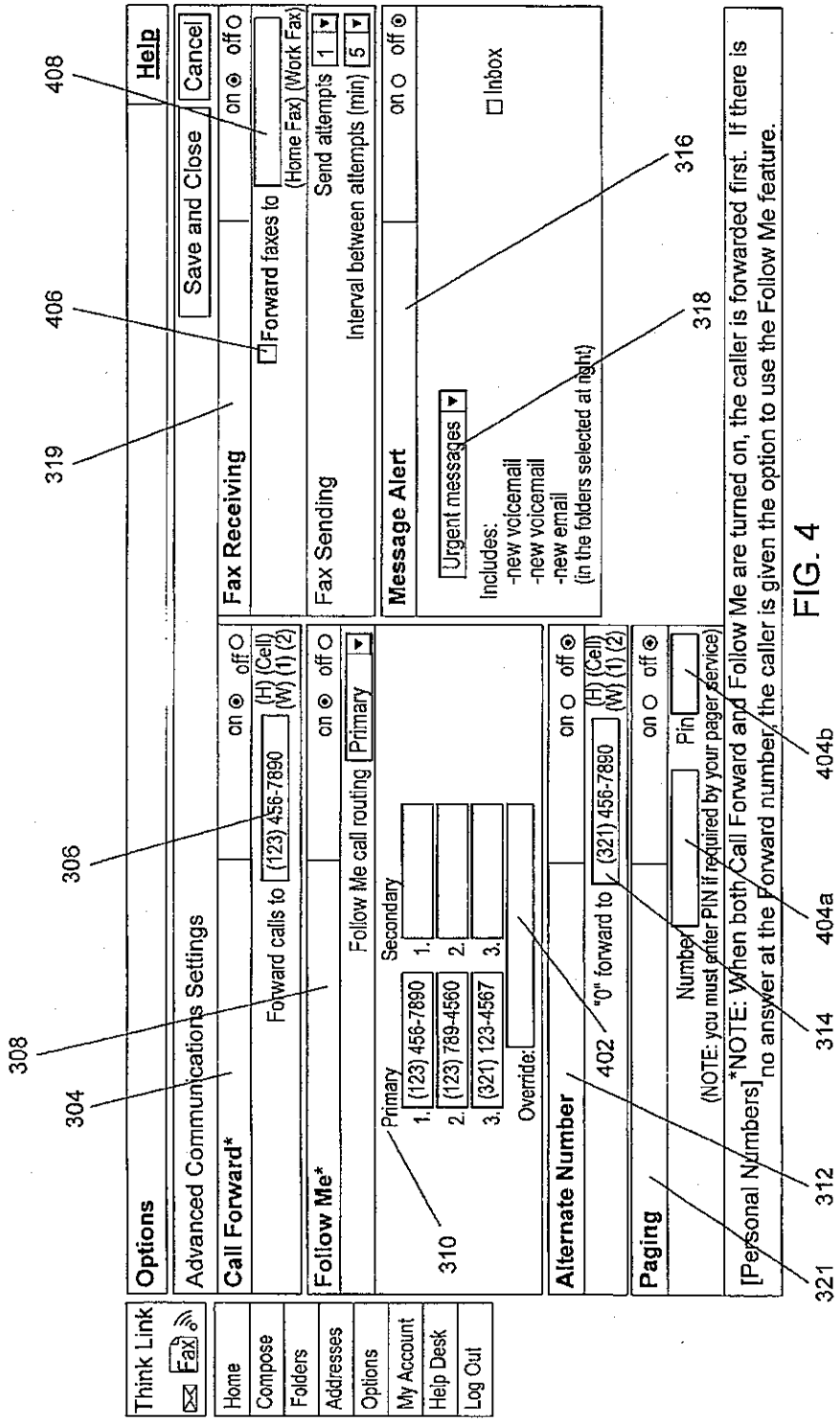
Think Link
Fax
Home
Compose
Folders
Addresses
Options
My Account
Help Desk
Log Out
Options
Help
Advanced Communications Settings
Save and Close
Cancel
Call Forward*
on ◉ off ○
Forward calls to (123) 456-7890 (H) (Cell) (W) (1) (2)
Follow Me*
on ◉ off ○
Follow Me call routing Primary
Primary
1. (123) 456-7890
2. (123) 789-4560
3. (321) 123-4567
Secondary
1.
2.
3.
Override:
Alternate Number
on ○ off ◉
"0" forward to (321) 456-7890 (H) (Cell) (W) (1) (2)
Paging
on ○ off ◉
Number Pin
(NOTE: you must enter PIN if required by your pager service)
Fax Receiving
on ◉ off ○
Forward faxes to (Home Fax) (Work Fax)
Fax Sending
Send attempts 1
Interval between attempts (min) 5
Message Alert
on ○ off ◉
Urgent messages
Includes:
-new voicemail
-new voicemail
-new email
(in the folders selected at right)
Inbox
[Personal Numbers] *NOTE: When both Call Forward and Follow Me are turned on, the caller is forwarded first. If there is no answer at the Forward number, the caller is given the option to use the Follow Me feature.
308
304
306
408
406
319
316
318
310
402
314
404a
404b
312
321

FIG. 4

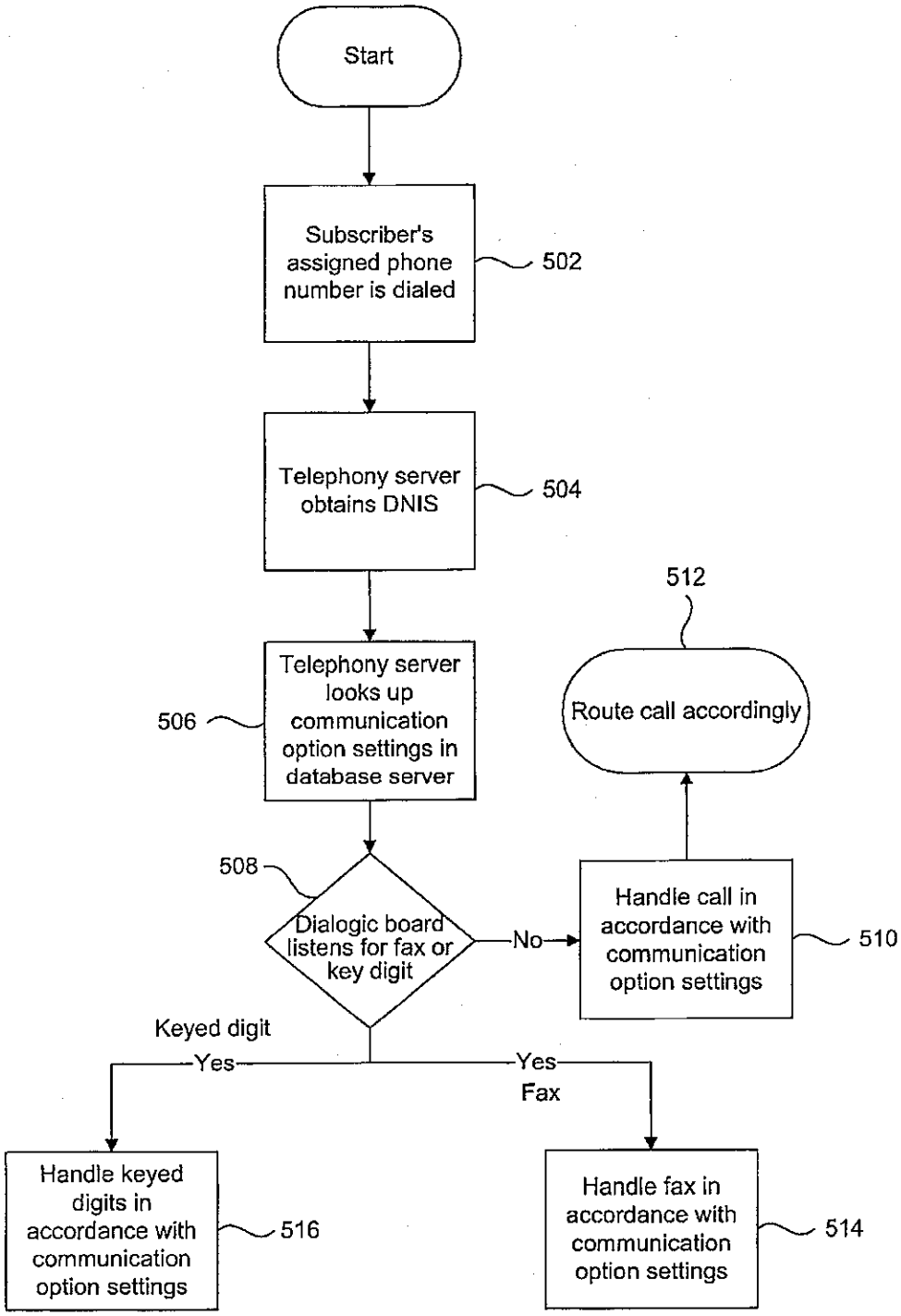
Start
Subscriber's assigned phone number is dialed
502
Telephony server obtains DNIS
504
Telephony server looks up communication option settings in database server
506
512
Route call accordingly
508
Dialogic board listens for fax or key digit
No
Handle call in accordance with communication option settings
510
Keyed digit
Yes
Yes
Fax
Handle keyed digits in accordance with communication option settings
516
Handle fax in accordance with communication option settings
514

FIG. 5

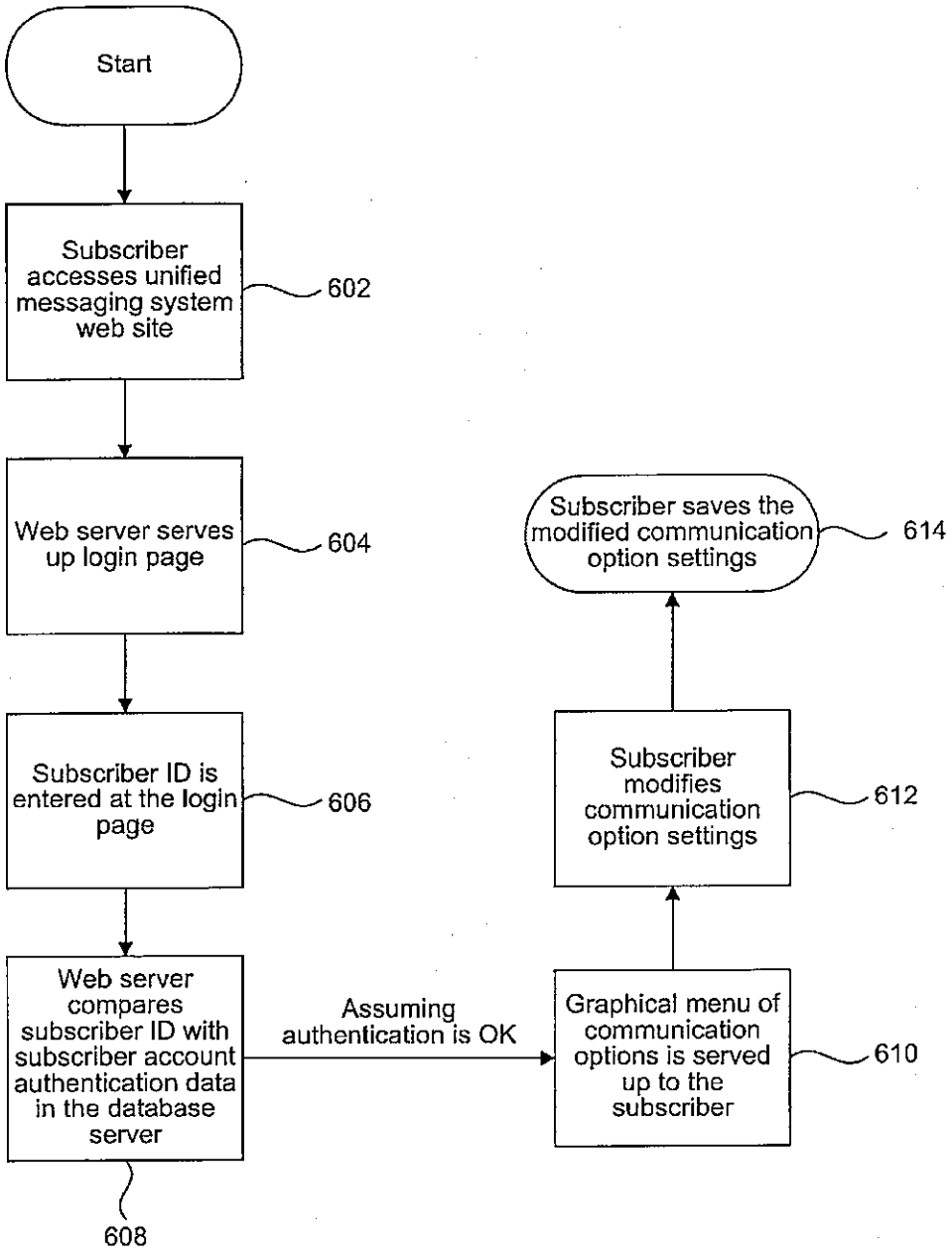
Start
Subscriber accesses unified messaging system web site
602
Web server serves up login page
604
Subscriber ID is entered at the login page
606
Web server compares subscriber ID with subscriber account authentication data in the database server
608
Assuming authentication is OK
Graphical menu of communication options is served up to the subscriber
610
Subscriber modifies communication option settings
612
Subscriber saves the modified communication option settings
614

FIG. 6

CENTRALIZED COMMUNICATION CONTROL CENTER FOR VISUALLY AND AUDIBLY UPDATING COMMUNICATION OPTIONS ASSOCIATED WITH COMMUNICATION SERVICES OF A UNIFIED MESSAGING SYSTEM AND METHODS THEREFOR

RELATED APPLICATIONS

The following commonly-owned, co-pending patent applications are related and are incorporated herein by reference.

Ser. No. 09/239,560, filed Jan. 29, 1999, entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA";

Ser. No. 09/240,367, filed Jan. 29, 1999, entitled "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITH A THIN WEB BROWSER";

Ser. No. 09/239,584, filed Jan. 29, 1999, entitled "COMPUTER-IMPLEMENTED CALL FORWARDING OPTIONS AND METHODS THEREFOR IN A UNIFIED MESSAGING SYSTEM";

Ser. No. 09/240,893, filed Jan. 29, 1999, entitled "INTERACTIVE BILLING SYSTEM UTILIZING A THIN WEB CLIENT INTERFACE";

Ser. No. 09/240,368, filed Jan. 29, 1999, entitled "A SYSTEM AND METHOD TO MANAGE PHONE SOURCED MESSAGES";

Ser. No. 09/240,434, filed Jan. 29, 1999, entitled "METHOD AND APPARATUS FOR NETWORK INDEPENDENT INITIATION OF TELEPHONY";

Ser. No. 09/240,435, filed Jan. 29, 1999, entitled "APPARATUS AND METHOD FOR DEVICE INDEPENDENT MESSAGING NOTIFICATION";

Ser. No. 09/240,436, filed Jan. 29, 1999, entitled "APPARATUS AND METHOD FOR CHANNEL-TRANSPARENT MULTIMEDIA BROADCAST MESSAGING";

Ser. No. 09/240,589, filed Jan. 29, 1999, entitled "VOICE ACCESS THROUGH A DATA-CENTRIC NETWORK TO AN INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM".

BACKGROUND OF THE INVENTION

The present invention relates to communication services available via a data-centric network (i.e., a network that carries digital data) and a telephony-centric network (i.e., a network that carries telephony information such as voice, fax, pager, and the like). More particularly, the present invention relates to a centralized facility and methods therefor that allow a subscriber of various communication services to review and customize his communication options, in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

Both the data-centric network (e.g., a distributed computer network) and the telephony-centric network (e.g., public telephone network) have existed for some time. Broadly speaking, the data-centric network (such as the Internet) may be thought of as a global computer network that connects millions of computer terminals all over the world in such a way that digitized information can be exchanged irrespective of the different hardware and software platforms that may be utilized to gain access to the data-centric network. People and businesses around the world use the data-centric network to retrieve information, communicate and conduct business globally, and access a vast array of services and resources on-line. In a similar manner, the telephony-centric network (whether wired or wireless) may also be thought of as another global network that connects the millions of telephony devices (such as voice-oriented telephones, pagers, facsimile machines, voice mail boxes, and the like) together in such a way that a user at one of the telephony devices can readily transmit information to other telephony devices irrespective of geographic boundaries.

In the past, these two networks existed as separate domains. This is because the widely accessible data-centric network is a fairly recent phenomenon. For decades, the only network that has been available to the masses is the analog telephony-centric network, starting with the telegraph network of the nineteenth century. However, as more and more of the services traditionally offered through the telephony-centric network are being offered in a digital format by the data-centric network, the distinction between the data-centric network and the telephony-centric network begins to blur. Irrespective of whether these two networks exist as separate networks physically or conceptually going forward, the legacies of their separate existence can be seen in the various different communication services and communication devices that currently exist.

By way of example, there exist many different communication devices and services available today to allow a person to communicate to another person, e.g., telephones, facsimile machines, electronic mail (e-mail), pagers, voice mail, and the like. Generally speaking, a telephone is a communication device employed to transmit and receive speech and other sounds. A facsimile machine is a communication device to transmit and receive graphical data. A pager is a highly portable device that allows its user to receive data, and in some cases transmit limited data to a pager service provider. A voice mail box is essentially a service that allows one person to temporarily store telephone messages for retrieval by another. E-mail services allow e-mail users to transmit and receive data from computer terminals connected to the data-centric network. All these devices and services are well known in the art and will not be elaborated further for the sake of brevity.

Currently, these communication services are viewed, both by the service providers who create and maintain the network infrastructure and the subscribers who employ the devices and networks for communication, as separate services. This is due, partly but not entirely, to past government deregulation efforts and gradual technological evolution that have given rise to different service providers, all competing to provide the communication services to individual consumers. Thus, it is not unusual for a consumer to have an e-mail account with one service provider, a telephone account with another service provider and a pager account with yet another service provider. Even if the different services are contracted through a single service provider, the dual existence of the data-centric network and the telephony-centric network, as well as existing billing and account management infrastructures, often force the service provider to manage each of these services as a separate account.

One of the consequences of having different accounts for different services is the proliferation of telephone numbers, facsimile numbers, and pager numbers that a typical consumer must deal with. Thus, it is not at all unusual for a

consumer to have a home telephone number, a work telephone number, one or more cellular telephone numbers, a pager number, and a facsimile number, with each of these numbers being assigned to a different communication device. Not only are these various numbers difficult to remember for the consumer, they are confusing to others.

A more serious consequence is the burden on the consumer who needs to manage the communication options associated with the different services (which are now assigned to different physical devices and managed as different accounts) to ensure that incoming and outgoing messages are properly handled. By way of example, a person who travels may wish to forward voice calls made to his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to his office facsimile machine to a facsimile machine that is more local. While in a meeting, however, he may wish to temporarily divert the voice calls to his voice mail box or forward it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time he arrives at a new location.

To accomplish the above, the person in the above example currently needs to first ascertain the current communication option settings associated with the various services that he uses. Unless he is diligent in noting and/or remembering the recent changes in the communication option settings, he may need to call each of the service providers to find out what the current communication option settings are. Assuming that he knows the current communication option settings and such calls need not be made, the user must still access each communication device and/or contact each service provider to reroute the incoming and outgoing messages.

By way of example, some facsimile machines currently allow the user to forward the incoming facsimile to another facsimile machine by entering a particular combination of the forwarding number and predefined codes on the facsimile machine keypad. Likewise, many telephone systems require the user to physically enter the forwarding telephone number and predefined codes on the keypad of the telephone from which forwarding originates. However, this requires the user to be physically present at the facsimile machine or telephone from which forwarding originates. If he owns one of these telephones or facsimile machines and is on the road, such forwarding would not be possible absent help from another person who has such physical access.

The fact that each communication service is treated as a different account also requires the user in the example above to access each account and/or service provider to accomplish the changes. Thus, multiple calls may need to be made to change the communication option settings associated with the different communication services. Even with automated response systems in place to handle such changes, these calls take time and can aggravate even the most patient users, especially if multiple calls need to be made to the multiple service providers each time he moves from one location to another. As can be appreciated by those skilled in the art, such approach is at best time consuming and unwieldy.

More typically, a busy user would just not bother changing the communication options associated with the various communication devices that he owns. He would rather suffer the possibility of missing out on some messages than constantly contacting the different service providers and making changes on individual services. In this case, the communication services that he owns are not employed to their fullest potential.

In view of the forgoing there are desired improved techniques for allowing a user of communication services to review and customize the communication options associated with these services in a simplified and convenient manner.

SUMMARY OF THE INVENTION

The invention relates, in one embodiment, to a computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options is accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The computer-implemented control center includes a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on one of the display terminals when the subscriber employs the one of the display terminals to access the computer-implemented control center. The computer server also is configured to receive from the subscriber via the one of the display terminals a first change to the communication options and to update the first change to the account in the subscriber communication profile database.

There is further included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to one of the telephones when the subscriber employs the one of the telephones to access the computer-implemented control center. The telephony server also is configured to receive from the subscriber via the one of the telephones a second change to the communication options and to update the second change to the account in the subscriber communication profile database.

The invention relates, in another embodiment, to a computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services includes a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options are accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The method includes providing a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included visually displaying the communication options on one of the display terminals, using a

computer server coupled to exchange data with the subscriber communication profile database, when the subscriber employs the one of the display terminals to access the computer-implemented control center. There is further included receiving from the subscriber via the one of the display terminals at the computer server a first change to the communication options. The first change to the communication options pertains to either the voice telephone service or the e-mail service. Additionally, there is included updating the first change to the account in the subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to the subscriber at the unified messaging system, including the voice telephone service, are handled in accordance with the first updated subscriber communication profile database.

These and other features of the present invention will be described in more detail below in the detailed description of the invention and in conjunction with the following figures.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

FIG. **1** depicts, in one embodiment, the general overview of the unified message system.

FIG. **2** illustrates, in one embodiment, how the 48 telephone lines provided per T1 link may be divided among the sub-servers of the telephony server.

FIG. **3**, in one embodiment, the user interface portion of the computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer display screen.

FIG. **4** shows the communication options in greater detail, in accordance with one embodiment of the present invention.

FIG. **5** is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unified messaging system through the telephony-centric network by a subscribing or a non-subscribing caller.

FIG. **6** is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system through a computer network by a subscriber.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described in detail with reference to a few referred embodiments thereof and as illustrated in the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to one skilled in the art, that the present invention may be practiced without some or all of these specific details. In other instances, well known process steps have not been described in detail in order not to unnecessarily obscure the present invention.

In accordance with one aspect of the present invention, there is provided a computer-implemented control center which is coupled to the data-centric network and the telephony-centric network, and which allows a user to access, using either a telephone or a computer, the communication options associated with the various communication services of a unified messaging service. Unlike the prior art approach which requires the user to contact individual service providers/accounts and/or to access individual communication devices to review and change the communication options associated therewith, the computer-implemented control center allows the communication options associated with the various communication services to be accessed substantially all at once. That is, the computer-implemented control center provides a single central facility through which the communication option settings associated with the different communication services may be reviewed and/or modified.

In accordance with one aspect of the present invention, the communication options, which include the options associated with individual communication services as well as routings among the different individual communication services, are accessible using either a computer network interface (e.g., a web page) or a telephone network interface (e.g., via a telephone). The communication option settings themselves do not reside with individual communication devices or require access through a particular communication device (such as with the assigned facsimile machines or telephones discussed earlier). Rather, the communication option settings are centralized within the universally accessible computer-implemented control center and can be utilized to properly control the communication options associated with the various services and to facilitate control of the routings therebetween. More importantly, they can be reviewed and modified by a properly authenticated subscriber of the unified messaging service through any suitable computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

In the aforementioned co-pending patent applications entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA" (Ser. No. 09/239,560 filed Jan. 29, 1999), and "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITH A THIN WEB BROWSER (Ser No. 09/240,367, filed Jan. 29, 1999), which are all incorporated herein by reference, some inventive unified messaging services and their various features are disclosed. Although the present invention may be implemented on any unified messaging system, reference may be made to the above-mentioned co-pending patent applications for details pertaining to preferable unified messaging systems on which the present invention may be implemented.

In general terms, a unified messaging system benefits a user by integrating various communication services, which up to now have existed as separate services. The integration facilitates simplified management, billing, and more importantly the routing of messages among the various services. With a unified messaging service, a user may, for example, specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, or the like. Within limits, a unified messaging system allows messages to be received, stored, retrieved, and/or forwarded (in the original format or in a different/abbreviated format) without regard to the communication devices and/or networks (i.e., data-centric vs. telephony-centric) employed for the transmission of the messages.

A unified messaging system implemented on a data-centric network takes the unified messaging system concept

a step further by internally storing and manipulating the messages in a digital format irrespective of whether the message was received and/or will be sent in the digital or analog format. As is well known, digital formatting increases the flexibility with which information contained in the messages can be analyzed, stored, manipulated, and/or routed among the various communication devices. More importantly, the implementation of the unified messaging system on a data-centric network permits the subscriber to access his account through any computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

To facilitate discussion, FIG. **1** depicts, in accordance with one embodiment of the present invention, the general overview of a unified message system **101**. With reference to FIG. **1**, there is shown a user computer **100**, representing a computer that may be employed to access and/or modify the communication options associated with the communication services offered by the unified messaging system. Although user computer **100** is shown to be a desktop personal computer (such as an Intel-based personal computer), user computer **100** may in fact represent any computing device capable of accessing the data-centric network (represented by reference **102** in FIG. **1**). By way of example, user computer **100** may represent a laptop computer, which may access the data-centric network either through wired connections or in a wireless manner. As another example, user computer **100** may represent a personal digital assistant (PDA) or a palm-top computer, or a thin-client type computer.

Data-centric network **102** may represent any computer network which couples together users from geographically dispersed locations. In a preferred embodiment, data-centric network **102** represents the Internet, although data-centric network **102** may also represent a Wide Area Network (WAN), a Local Area Network (LAN), a Virtual Private Network (PN) or any similarly suitable networking arrangement that allows users to log in from a remote terminal.

With reference to FIG. **1**, there is shown data link **104**, representing the high speed data lines for transmitting and receiving data between unified messaging system **101** and data-centric network **102**. In a preferred embodiment, data link **104** is implemented by high speed T1 data lines, although other types of data lines such as fiber optics may also be employed. A network interface system **105** couples data link **104** to the remainder of unified messaging system **101**, which is shown to include four servers as shown (the servers are discussed later herein).

Network interface system **105** represents the interface system that ensures data is properly transmitted and received between unified messaging system **101** and data-centric network **102**. Of course network interface system **105** may vary depending on the implementations of the data-centric network and/or the portion of unified messaging system **101** to which network interface system **105** is coupled.

In the case of the Internet, one current preferred implementation of network interface system **105** may include a router **106**, a hub **108**, a DNS (Domain Name System) facility **110**, and a firewall **112**. Typically, the router **106** is a piece of hardware or software that examines the IP address of data packets and determines the routing of the data packets based on the IP address.

Router **106** acts cooperatively with hub **108** and DNS facility **110** to permit properly addressed data packets to be received through firewall **112**. Router **106**, hub **108**, DNS facility **110**, and firewall **112** are conventional and will not be belabored here for the sake of brevity.

At the heart of the unified message system are a set of servers which are coupled to exchange data and are connected to firewall **112** and the public telephone network. Typically, a server represents a computer that processes data for use by other data-consumer devices (such as other servers, computers or any of the communication devices through a proper interface circuit). There is shown a database server **120**, which is employed to, among other tasks, organize and maintain the subscriber communication profile database. The subscriber communication profile database itself may reside with database server **120** and represents a data store of subscriber accounts and communication option settings associated therewith. Incoming messages to a particular subscriber or outgoing messages from that subscriber are formatted and routed in accordance with the communication option settings stored in the subscriber communication profile database. Properly authorized changes to the communication option settings will be reflected in the communication option settings stored in the subscriber communication profile database and employed to handle subsequent messages (whether incoming or outgoing).

Subscriber authentication data may be employed to access to a subscriber communication profile database. Subscriber authentication data may be stored in the database server. Subscriber authentication may be accomplished using several techniques. For example, a numeric password, an alphanumeric password, a hidden code wherein the password is randomly hidden in a string (i.e., xxxpppxx, xppppxxxx, etc.) and biometrics (e.g., retina scans, hand prints, palm prints, finger prints, voice recognition, etc.).

A web server **122** is employed to facilitate interaction between unified messaging system **101** and data-centric network **102**. Web server **122** represents one of the system-side servers (i.e., a server that handles the exchange of data with the user's computer via the data-centric network) and is employed, for example, to present to user computer **100** the log-in screen when a subscriber employs user computer **100** to access the unified messaging service. Once that subscriber is properly authenticated (e.g., through a password procedure or another suitable authentication procedure), web server **122** then communicates with database server **120** to obtain the current communication option settings for that subscriber and to display the current communication option settings and an individualized web page to the subscriber for review.

In one preferred embodiment, web server **122** is employed to store all messages pertaining to a particular subscriber. The messages are stored as files in web server **122**. These messages may represent, for example, voice files, facsimiles, e-mail messages, voice mail messages, or the like. Pointers in database server **120** facilitate access to the stored messages in web server **122**. However, it is contemplated that the messages may be stored in any of the servers discussed herein and/or in a separate storage device accessible by the servers.

An e-mail server **124** is employed to process incoming and outgoing e-mail messages. By way of example, e-mail server **124** may be employed to format/translate the e-mail messages so that they can be properly transmitted to other e-mail systems and understood thereat. For incoming messages, e-mail server **124** may be employed to format/translate the information transmitted via the incoming e-mail and to prepare them for use by other data consumers.

A telephony server **126** is shown coupled between telephone link **128** and the remainder of the unified messaging system and may include any number of subservers, such as

are shown in FIG. 2. In a manner analogous to web server 122, telephony server 126 represents a systemt-side server (i.e., a telephony server that handles the exchange of information with the user via the telephony-centric network) and is employed to facilitate interaction between unified messaging system 101 and telephony-centric network 129. Telephony server 126 may be employed to, for example, translate the telephone signals (such as the dialed digits) into a digital format for the purpose of authenticating and allowing subscriber access. Telephony server 126 may also be employed to translate such dialed digits and/or other telephone signals (such as a facsimile tones or verbal commands) into digital data, which may then be employed to facilitate handling of messages and/or the communication option settings. In one embodiment, Dialogic board models D 240 SC-T1, D 480 SC-1, CP-4/SC, CP-6/SC, and/or CP-12/SC (available from Dialogic Corporation of Parsippany, N.J.) are employed to facilitate the translation between telephone signals and digital data. Once translation is performed, software within telephony server 126 employs the digital data to decide how to handle the message using the communication option settings obtained from the subscriber communication profile database. If the subscriber, through predefined dialing sequences, indicates that he wishes to review and/or modify the communication option settings, software within telephony server 126 operates cooperatively with database server 120 to affect the change to the communication option settings. Once the communication option settings are reflected in the subscriber communication profile database stored in database server 120, the new communication option settings are consulted each time a message needs to be handled by the unified messaging system.

Telephony-centric network 129 represents any telephone network which couples together telephony-type communication devices (e.g., facsimile machines, pagers, telephones) from geographically dispersed locations. By way of example, telephony-centric network 129 may represent a plain old telephone system (POTS), a wired telephone network popularly known as Public Service Telephone Network (PSTN) or a cellular network or a combination thereof. Telephony-centric network 129 is well known and will not be discussed in great detail here for the sake of brevity.

A telephone 130 is shown coupled to telephony-centric network 129. In reality, it should be understood that a wide variety of telephony devices (which are not shown to simplify the illustration) are connected to telephony-centric network 129. Some of these exemplary communication devices are, as mentioned, facsimile machines, pagers, cellular telephone sets, wired telephone sets, and the like.

Telephone link 128 represents the telephone communication channels for transmitting and receiving telephone signals between unified messaging system 101 and telephony-centric network 129. In a preferred embodiment, telephone link 128 represents high bandwidth T1 telephone links, although other types of telephone links may also be employed. Note that there is no requirement that the data transmitted on telephone link 128 be analog. In fact, with the upcoming convergence of data networks and telephone networks, the telephony information that traverses telephone link 128 may well be digital (in which case, telephony server 116 will be adapted to handle digital telephony signals instead of analog telephony signals). As a noteworthy point, it is expected that as data networks and telephone networks converge, the relevant functionality represented by the servers herein may still apply, albeit with the proper modification to handle an all-digital combined data/telephone network.

FIG. 2 illustrates, in accordance with one embodiment of the present invention, how the 48 telephone lines provided per T1 link may be divided among the subservers of telephony server 126. As shown in FIG. 2, 45 of the telephone lines may be employed by a main message server 202 to handle the incoming/outgoing voice calls, the incoming voice mail messages, and the incoming facsimiles. Of the 45 telephone lines, 32 may be provisioned for the subscribing or non-subscribing users to dial into the unified messaging system, and the other 13 telephone lines may be employed to allow outgoing calls to be made from within the unified messaging system. The outgoing calls may, for example, be calls destined for the unified messaging system but are rerouted out of the unified messaging system in accordance with a subscriber's communication option setting or they may be originated by the subscriber, who dials into the unified messaging system (using a toll-free access number, for example) and requests an outgoing call be made therefrom to some destination number (for example by punching in the "#" key after authentication, followed by the destination number), thus employing the unified messaging system as a type of calling card service.

One of the 48 telephone lines of the T1 link may be reserved for outgoing facsimile transmission, which is handled by an outgoing facsimile server 204. Another telephone line may be apportioned for the outgoing paging service, which is handled by an outgoing pager server 206. Outgoing voice-mail messages are handled by voice mail server 208, which is coupled to another one of the 48 telephone lines of the T1 link as shown.

To elaborate, outgoing voicemails are voice messages sent to a voicemail phone number which may be created via the web or the telephone. Outgoing voicemails may be new voicemails, replies to other messages or forwarded as a voicemail. For example, when forwarding a voicemail via the web, the voicemail may be treated as an attachment to a speech synthesized text message with the recipient address as a telephone number. Outgoing voicemail servers may be geographically distributed and communicate with each other via internet in such a way that the server nearest the destination voicemail phone number may be assigned to send the voicemail via either a circuit-switched call or packet-switched call.

Outgoing facsimiles are facsimile messages sent to a facsimile telephone number which may be created via the web or the telephone. Outgoing facsimiles may be new facsimiles, replies to other messages, forwarded as a facsimile or call-forwarded as a facsimile in which the system stores the incoming facsimile and then forwards the facsimile to the subscriber's facsimile-forward number. For example, when forwarding a facsimile via the web, the facsimile may be treated as an attachment to Tiff conversion of a text message with the recipient address as a phone number. Like outgoing voicemail servers, outgoing facsimile servers may also be geographically distributed. Outgoing facsimile servers may communicate with each other via internet in such a way that the server nearest to the destination facsimile telephone number may be assigned to send the facsimile via either a circuit-switched call or packet-switched call.

Outgoing pages are paging messages sent to a pager number which may be created via the telephone either by the caller or by the system when sending notification. Like outgoing voicemail servers, outgoing page servers may also be geographically distributed. Outgoing page servers may communicate with each other via the internet in such a way that the server nearest to the destination pager telephone

number may be assigned to send the page via either a circuit-switched call or packet-switched call.

There may also be outgoing emails and their servers that do not involve circuit switched calls. Some pagers may be alphanumerical type and can receive messages as an email. In this case, the outgoing pager server may delegate these requests to the outgoing email servers.

In one embodiment, messages sent to the unified messaging system may be stored in web server **122** with pointers to these messages being held in database server **120**. The above mentioned set of sub-servers (outgoing facsimile server, outgoing pager server and outgoing voice mail server) are arranged to make requests to the database server for outgoing messages stored on the web server. If an outgoing message is detected by a sub-server, software within the sub-servers decides how to handle the outgoing message according to the communication option settings obtained from the subscriber communication profile database. Again, a Dialogic board may be employed, in one embodiment, to facilitate the translation between the stored data and the outgoing telephone signal.

All types of outgoing message requests (voicemail, facsimile, email, pages) are queued in the database server. These requests can also be associated with a delivery time (e.g., the default time is "now"). Each type of request may be stored in a separate queue. An outgoing server of a particular type of message periodically checks its queue from the database server to see if any request's time is up for delivery.

It should be noted that FIG. **2** shows only one exemplary way to divide the TI telephone lines among the various sub-servers of telephony server **126**. Depending on the traffic pattern generated by subscribing and non-subscribing users of the unified messaging system, these lines and sub-servers may be scaled as necessary.

FIG. **3** illustrates, in accordance with one embodiment of the present invention, the user-interface for an exemplary computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer display screen. Through computer-implemented control center **302**, the user may quickly and conveniently review the communication option settings associated with the various services and make changes thereto. That is, the computer-implemented control center **302** serves as the centralized control panel for reviewing and/or customizing the communication options associated with the various communication services. FIG. **4** illustrates aspects of computer-implemented control center **302** in greater detail.

In the exemplary implementation of FIG. **3**, six representative communication options are shown. The call forwarding service **304**, if it is enabled, allows incoming calls through telephony-centric network **129** to be routed to a provided forwarding number **306**. The call forwarding option setting may also be seen in the detailed computer-implemented control center view of FIG. **4**, which shows the communication options in greater detail.

To accomplish the forwarding, telephony server **126** consults, after a call is made to a subscriber's telephone number, the subscriber communication profile database in database server **120**. If the call forwarding option is enabled, that call is then forwarded to the forwarding number specified by telephony server **126** via an outgoing telephone line. If the forwarding number does not pick up, the call may be rerouted, for example, to the subscriber's voice mail box. If the call forwarding option is not enabled and the caller does not choose other methods discussed below to try to contact the subscriber, the call may then be forwarded to the subscriber's voice mail box as well.

The "follow me" service **308** gives the subscriber the ability to designate a set of telephone numbers where he may likely be found and gives the caller the option to try to find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. By way of example, during a work day, a given subscriber may be contacted either at his main office telephone, his secondary office telephone, or his cellular telephone in his car. On the weekend, that same subscriber may be found at home or at a cellular telephone in his boat. The office/car set of telephone numbers may be designated a primary set **310** and the home/boat set of telephone numbers may be designated a second set. FIG. **4** shows the communication options associated with the follow me service in greater detail.

On a week day, the subscriber may enable the follow me service option and select primary set **310** as the set of telephone numbers where he may likely be found. On the weekend, the subscriber may enable the follow me service option and select the secondary set, for example. From the caller's perspective, the follow me service is preferably an on-demand service. That is, the caller is preferably given the option to decide whether to employ the follow me service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice mail if unanswered.

If the follow me service is enabled by the subscriber and chosen by the caller, telephony server **126** will try to place outgoing calls to the numbers designated in the selected set starting with the first number in the set. To ensure that the call is not inadvertently completed vis-a-vis by a bystander who happens to be near the destination telephone and picks up the telephone when it rings, telephony server **126** may allow the caller to record his name. Telephony server **126** then announces the name to the person picking up the destination telephone prior to giving that person a choice of whether to accept the call. If the person who picks up the call is indeed the person for whom the call is intended, the entry of a predefined key press (on instructions by telephony server **126**) on the destination telephone keypad will allow telephony server **126** to complete the end-to-end connection. In this manner, the follow me service may be employed as a call screening mechanism if desired. Telephony server **126** may try all the numbers in the set in sequence until the subscriber is found. If not, the call may be allowed to pass into the subscriber's voice mail box.

In one embodiment, the follow-me service may not always use the same sequence to callout a subscriber when the subscriber has set up several numbers as his possible locations (e.g., weekday routine or weekend and evening routine). The follow-me service may use the number where the subscriber is last located (stored in memory) as the first number to dial in the sequence provided the time for the last location happened within a certain interval (e.g., an hour).

An alternate number service **312** gives the subscriber the ability to designate a telephone number as an alternate number where the caller can attempt to locate the subscriber (or someone who may appropriately handle the incoming call) at a number designated in advance (**314**). FIG. **4** shows the communication options associated with the alternate number service in greater detail. The alternate number option is similar to call forwarding with the exception that the alternate number option is an on-demand service. That is, the caller is preferably given the option to decide whether to

employ the alternate number service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice-mail if unanswered. In all other respects, the alternate number service may function in the same way as the call forwarding service. An alternate number may also be used to set a personal operator number (e.g., your secretary).

A message alert option **316** gives the subscriber the ability to select whether to be alerted when a message is received. The message that triggers the alert may be specified using any number of filtering criteria stored as part of the subscriber communication option settings. In the example of FIG. **3**, the filtering criteria is "urgent" (**318**) although any type of filtering may be applied. For example, the filtering criteria could be the message's sender, subject or content. The sender could be identified by his email address or phone number (e.g., caller ID).

FIG. **4** shows, in one embodiment, the communication option settings associated with the unified messaging service in greater detail. With respect to the message alert service, the alerting itself may be accomplished using any of the communication devices controlled by the unified messaging system (e.g., pager, telephone at a designated number, voice mail in a designated voice mail box, facsimile at a designated facsimile number, e-mail at a designated e-mail address, and the like). In accordance with one particularly advantageous embodiment, the message alert is sent to a pager via outgoing pager sub-server **206** since it is the device most likely to be near the subscriber. In one embodiment, the server that sends the alert (e.g., the web server if the incoming message is an e-mail, the telephony server if the incoming message is a facsimile or telephone call) may send out a predefined alphanumeric code that identifies the type of incoming message. The alphanumeric code itself may be predefined either by the unified messaging system or by the subscriber if customization is desired. Preferably, the alert is sent to the subscriber's own number to alert the subscriber that an incoming message fitting the filtering criteria has been received at the unified messaging system.

A facsimile receiving service **319** allows the user to receive facsimile at the unified messaging system if someone sends a facsimile to the subscriber's telephone number. FIG. **4** shows the communication options associated with the facsimile receiving service in greater detail. If the facsimile receiving option is enabled, telephony server **126** will monitor for the facsimile tone and process the incoming message as a facsimile if the facsimile tone is detected. In one embodiment, the incoming facsimile is stored as a GIF or TIFF file that may be viewed by the subscriber through a web page by clicking on facsimile mail link **320**. If the facsimile forward option **406** is also enabled, the facsimile will also be forwarded by the outgoing facsimile server **204** to another facsimile machine at specified facsimile number **408**, additionally or alternatively to storing a copy of the received facsimile at the unified messaging service. If the facsimile option is not enabled but the call forwarding option is enabled, the call is forwarded on and may be picked up by the forwarded device (if it is a functioning facsimile machine). If not, the incoming facsimile will not be received.

A paging service **321** allows a message sent to the subscriber to be rerouted to a pager designated by the subscriber. Paging service **321** is preferably an on-demand service and allows the caller, if desired, to send a short message to a pager designated by the subscriber. The pager number designated by the subscriber may be designated at location **404***a* (the paging service number) and, if required, using location **404***b* (the PIN number for the pager). If the paging service is enabled, a caller to the subscriber's telephone number will be given an option to send a short message to the pager subscriber pager (for example, by pressing a predefined key to send the short message). As noted before, the caller may also choose any of the other services follow me service **308** and/or alternate number **312** if enabled. In this manner, a single telephone number may serve as the access point to receive a page, a voice message, a facsimile, etc.

For alphanumeric pagers with an email address, the outgoing page server may use text to describe the alert message (e.g., "you have a urgent voicemail from caller ID 4152222222 with return number 4153333333") instead of codes as in the case of numeric pagers. The outgoing pager server can then delegate the alert messages to the outgoing email server.

Voice mail messages that are stored may be listened to using either the computer (through an appropriate software/sound card) by clicking on voice mail link **330** (FIG. **3**) or a telephone coupled to the telephony-centric network. E-mails that are sent to the subscriber using the subscriber's e-mail address may be read on-line by, for example, clicking on e-mail link **332** (FIG. **3**). In one embodiment, telephone server **126** may be equipped with a text-to-speech facility to allow the subscriber to listen to the content of the e-mail message through a telephone. FIG. **3** also shows an outgoing e-mail link **334**, which links the subscriber to an e-mail application program to allow the subscriber to compose and send out e-mail messages. In the case of replying an email via phone, a voice recording may be taken and sent as an email attachment.

As can be appreciated from the above examples, computer-implemented control center **302** provides a central visual interface that allows a subscriber to efficiently review and/or modify the communication option settings associated with the various communication services offered. This is in sharp contrast with time-consuming and burdensome prior art approaches whereby the person is required to contact different entities and deal with different accounts to change the communication options associated with different communication services.

In one embodiment, the computer-implemented control center has two views: the minimized view and the full view. In the minimized view (e.g., FIG. **3** in one embodiment), the computer-implemented control center may simply show the simplified routing details and the on-off settings associated with the communication options. Although the user may make changes to the on-off settings, fuller edit capabilities are preferably provided in the full view. In the full view (e.g., FIG. **4** in one embodiment), the computer-implemented control center additionally add explanations and detailed routing choices. If desired, an authentication procedure may be implemented with either the minimized view or the full view to ensure that the person making editing changes to the communication options is properly authorized.

It should be appreciated that the communication services and options discussed in connection with FIGS. **3** and **4** are only illustrative of the capabilities of the inventive computer-implemented control center. It should be apparent to those skilled in the art that the same control panel may be presented to the subscriber through the telephony server and the telephone interface if the subscriber wishes to review and/or change the communication options using a telephone connected to the telephony-centric network. The communi-

cation options may be presented in a sound format and the subscriber may be offered an option menu to review and/or change any communication option setting. Further, it should also be apparent to those skilled in the art that communication services options other than the preferred and discussed communication services and options can readily be controlled by the inventive computer-implemented control center. Irrespective of the services and options involved, a subscriber can access the centralized computer-implemented control center through either a computer connected to the data-centric network or a telephone connected to the telephony-centric network to review and/or change the communication options.

FIG. **5** is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unified messaging system through the telephony-centric network by a subscribing or a non-subscribing caller. The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages or e-mail messages, to use the unified messaging system as a calling card service, or to review and/or modify the communication options. A non-subscribing caller may access the unified messaging system to, for example, send a facsimile, a page, or to call the subscriber. The first step **502** involves accessing the unified message system through a telephone using the subscriber's assigned telephone number. A set of two numbers may be assigned to a user, a local telephone number and a toll-free telephone number, both of which may be associated with a single user account.

The dialed digits reaches telephony server **126** via telephone link **128**. Telephony server **126** then obtains the DNIS (direct number information service) by digitizing the dialed digits (step **504**) and employs the dialed digits to obtain the communication option settings associated with the account represented by the dialed telephone number (step **506**). As mentioned earlier, these communication option settings reside in the subscriber communication profile database, which may be managed by database server **120**, in one embodiment. During this time, telephone server **126**, through an appropriate interface board such as the aforementioned Dialogic board, monitors the incoming line for a facsimile tone or telephone key digit tone.

If no such facsimile tone or telephone key digit tone is detected (step **508**), the call is assumed to be a normal call to the subscriber and will be handled (in steps **510** and **512**) in accordance with the communication option settings in the manner discussed earlier (e.g., forwarded if call forwarding is on, routed to an alternate number if the caller selects that option and alternate service is enabled, and the like).

On the other hand, if a facsimile tone is detected by telephony server **126**, the call will be handled as an incoming facsimile in accordance with the communication option settings (step **514**). By way of example, if the facsimile receiving service is enabled, a copy of the facsimile will be stored for later retrieval by the subscriber. If the facsimile forwarding option is enabled, a copy of the facsimile is alternatively or additionally sent to the forwarded facsimile number.

On the other hand, if a keyed digit tone is detected by telephony server **126**, software within telephony server will handle the options chosen by the caller (step **516**). By way of example, one option may represent the subscriber wishing to access the computer-implemented control center (via an appropriate key press) to review and/or change the communication options. In this case, telephony server **126** preferably serves up the account statistics, e.g., how many voice mail messages, facsimiles, e-mail messages, etc. are waiting and asks the caller for authentication as a subscriber. If there are none, the subscriber may wish to quickly hang up and not go through the authentication procedure (and extending the cost of the call). This, however, is an option and may be eliminated if privacy is a concern (that is, authentication may take place before the presentation of account statistics).

Telephony server **126** may then obtain the authentication data from the caller (e.g., the password) and compare it with the subscriber account authentication data, which it obtains from the subscriber communication profile database in the database server. Authentication may be done via keyed digit entry or, in one embodiment, by voice commands, which may then be translated to keyed digits by appropriate software. If authenticated, the subscriber may then be presented with a menu that allows the subscriber to review and/or change the communication options via key press or voice commands. Once the subscriber saves the changes, the changed communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

As one of the options, the subscriber may be given a choice (with proper authentication) to use the unified messaging system to originate an outgoing call. The choice may be made via, for example, a predefined key press or voice command. This is useful in situations wherein the subscriber accesses his account at the unified messaging system through his toll-free number (e.g., from the airport or from someone else's telephone) and instructs the telephony server to connect his incoming call to an outgoing call to a provided destination telephone number and charges the cost to his account. In this manner, the unified messaging system may be employed as a convenient calling card.

A keyed digit may also represent an on-demand service selection chosen by the caller. In this case, the caller simply presses an appropriate key when prompted and employs one of the on-demand services is then employed to handle his call. Various on-demand services have been discussed in connection with FIGS. **3** and **4** and will not be repeated here for the sake of brevity.

FIG. **6** is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system by a subscriber through a data-centric network (such as the Internet in the example of FIG. **6**). The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages, view stored e-mail messages or facsimiles, send e-mail messages or facsimiles, or to review and/or modify the communication options. The first step **602** involves accessing the unified messaging system web site, using a unified messaging system web address (e.g., "unifiedmessagingsystem.com"), with user computer **100** through a data-centric network **102**.

The web site request connects to the web server **122** via data link **104** and network interface system **105**. Following connection to the web site, the unified messaging system web server **122** serves up a login page using, for example, ASP-active server pages (step **604**). The next step (step **606**) includes entering authentication data such as a subscriber identifier (ID), e.g., username and password, at the login page. The web server **122**, after obtaining the authentication data, compares it with the subscriber account authentication data (step **608**), which it obtains from the subscriber communication profile database from the database server. If

authenticated, the subscriber may then be presented with a graphical menu of the communication options (step **610**) that allows the subscriber to retrieve his email/voicemail/fax messages, or review and/or modify the communication options via user computer **100** (step **612**). Once the subscriber saves the changes (step **614**), the modified communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

Accordingly, the present invention provides a single centralized facility that gives a subscriber of various communication services (e.g., telephone, facsimile, pager, e-mail) the ability to review and modify his communication options (e.g., call forwarding, follow me service, alternate number, message alert, facsimile receiving, paging, routings and the like). This review and modification is done in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

The unified messaging system benefits a subscriber by integrating various communication services which up to now have existed as separate services. This is in sharp contrast to the prior art where the dual existence of the data-centric network and the telephony-centric network has forced the service providers to manage communication options as separate accounts.

This integration simplifies management, billing, and more importantly the routing of messages among the various services. The unified messaging system gives the subscriber more control with regards to how the world communicates to the subscriber. For example, a subscriber may specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, etc. The unified messaging system allows messages to be received, stored, retrieved, and/or forwarded without regard to the communication devices and/or networks employed for the transmission of the messages. In fact, the unified messaging system even gives non-subscribers choices with its on-demand services associated with some of the communication options.

The unified messaging system advantageously removes the burden of managing different physical devices and different accounts. The subscriber no longer has to access multiple accounts to modify options. As mentioned previously, a person who travels may wish to forward calls made from his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to an office facsimile machine to a facsimile machine that is more local. While in a meeting, however, one may wish to temporarily divert the voice calls to a voice mail box or forwards it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time one arrives at a new location.

Using the present invention, a person need only access the unified messaging system either with a telephone or a computer. The communication options may then be modified as needed with a few key strokes. The subscriber has the ability to review communication options at a single facility and no longer has to recall communication options from memory or contact each service provider.

Furthermore, the present invention advantageously allows remote access to the unified messaging system from any location that is connected to the data-centric network or the telephony-centric network. The subscriber no longer has to be physically present at the forwarding origin to modify the forwarding option. This advantage leads to yet another advantage in that the unified messaging system may be used as a calling card. The subscriber if located at the airport, for example, contacts his unified messaging system toll-free telephone number. The system then allows the subscriber the option of rerouting this call to another location.

Also, the present invention advantageously allows the subscriber the convenience of one telephone number (or two, including a toll-free 800 number). Multiple number confusion is avoided by connecting multiple numbers through the one number of the unified messaging system.

While this invention has been described in terms of several preferred embodiments, there are alterations, permutations, and equivalents which fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services;

a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computer-implemented control center through said data-centric network, said computer server also being configured to receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication profile database, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service; and

a telephony server coupled to exchange data with said communication profile database, said telephony server

being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center, said telephony server also being configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

2. The computer-implemented control center of claim 1 further comprising:

a pager server coupled to exchange data with said communication profile database, wherein said communication services further include a pager alert service and wherein said communication options further include a pager alert option, said pager server being configured to transmit, when said pager alert option is enabled, an alert to a pager through said telephony-centric network if an e-mail message is received by said subscriber through said data-centric network, said pager having a page number that is also specified as part of said pager alert option.

3. The computer-implemented control center of claim 1 wherein said plurality of communication services include a call forwarding ice configured to permit said subscriber to specify whether a call received at a telephone number associated with said account be forwarded to a forwarding telephone number, said communication options including a call forwarding enable option and said forwarding telephone number.

4. The computer-implemented control center of claim 1 wherein said plurality of communication services include a follow me service, said communication options including a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers.

5. The computer-implemented control center of claim 4 wherein said follow me service is configured to ring in sequence each one of telephones associated said set of telephone numbers until said call by said caller is accepted.

6. The computer-implemented control center of claim 5 wherein said follow-me service is configured to ring first a last-found telephone number, said last-found telephone number representing a telephone number associated with a phone previously employed by said subscriber to answer an immediately preceding call to said subscriber.

7. The computer-implemented control center of claim 1 wherein said plurality of communication services include an alternate number service, said communication options including an alternate number service enable option associated with said alternate number service and an alternate telephone number, said alternate number service enable option, when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to an alternate telephone associated with said alternate telephone number.

8. The computer implemented control center of claim 1 wherein the first communication option includes a first routing option, and wherein the second communication option includes a second routing option.

9. The computer implemented control center of claim 8 wherein either the first routing option or the second routing option includes a plurality of routings.

10. The computer implemented control center of claim 1 wherein the first communication service and the second communication service are selected from a call forwarding service, a follow me service, an alternate number service, a message alert service, a fax receiving service or a paging service.

11. The computer implemented control center of claim 1 wherein said plurality of communication services comprise an e-mail service configured to permit said subscriber to receive and transmit e-mails through said data centric network, and a voice telephone service configured to permit said subscriber to receive and transmit voice calls through said telephony-centric network.

12. The computer-implemented control center of claim 11 wherein said plurality of communication services include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephony-centric network and said telephony server, said communication options including a facsimile receiving enable option associated with said facsimile service.

13. The computer-implemented control center as recited in claims 12 wherein said facsimile and said voice telephone service are both implemented using a single telephone number.

14. The computer-implemented control center of claim 1 further comprising a pager server coupled to exchange data with said communication profile database, wherein said communication services include a pager alert service, and wherein said communication options include a pager alert enable option associated with said pager alert service and a pager number, said pager alert option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a page by said caller to said pager number.

15. The computer-implemented control center of claim 1 wherein at least one of the communication service is an on-demand communication service, and wherein said communication options include an on-demand communication enable option associated with said on-demand communication service and a forwarding number, said on-demand communication enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call or message by said caller to said forwarding number.

16. A computer-implemented method for permitting a subscriber of a unified messaging system to customize communication options pertaining to a plurality of communication services associated with said unified messaging system through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said plurality of communication services comprising a voice telephone service and e-mail service, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said computer-implemented method comprising:

receiving, via either a first display terminal of said display terminals or a first telephone of said telephones, a request to access an account pertaining to said subscriber, said account including said communication options for said subscriber;

obtaining from a subscriber communication profile database said communication options for said subscriber in said account, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, wherein at least one of the communication services is an on-demand communication service, and wherein

said communication options include an on-demand communication enable option and a forwarding number associated with said on-demand communication service, said on-demand communication enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call or message by said caller to said forwarding number;

presenting said communication options for said subscriber on respective one of said first display terminals or through said first telephone from which said request to access is received, said communication options being visually presented in a single graphical menu arranged for displaying said communication options for each of the communication services at the same time on said first display terminal via an individualized web page associated with said subscriber or audibly presented at said first telephone;

receiving communication setting edits from said subscriber through said respective one of said first display terminal and said first telephone from which said request to access is received, said communication setting edits pertaining to said communication options; and

modifying said communication options in accordance with said communication setting edits, wherein said communication services are subsequently controlled in accordance with said communication options after said modifying.

17. The computer-implemented method of claim **16** wherein said plurality of communication services include a call forwarding service, said receiving said communication edits includes receiving at least one of a call forwarding enable option associated with said call forwarding service and a forwarding telephone number associated with said call forwarding service, said call forwarding enable option, when enabled by said subscriber, forwards calls destined for said subscriber at said unified messaging system to said forwarding telephone number, and wherein said modifying said communication options includes modifying a setting associated with said forwarding service in accordance with said at least one of said call forwarding enable option and said forwarding telephone number.

18. The computer-implemented method of claim **16** wherein said plurality of communication services include a follow-me service, said receiving said communication edits includes receiving, as one of said communication setting edits, at least one of a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers, and wherein said modifying said communication options includes modifying a setting associated with said follow-me service in accordance with said at least one of said follow-me service enable option and said set of telephone numbers.

19. A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, wherein at least one of the communication services is an on-demand communication service, and wherein said communication options include an on-demand communication enable option and a forwarding number associated with said on-demand communication service, said on-demand communication enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call or message by said caller to said forwarding number;

a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computer-implemented control center through said data-centric network, said computer server also being configured to receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication profile database;

a telephony server coupled to exchange data with said communication profile database, said telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center, said telephony server also being configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

20. A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services;

a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computer-implemented control center through said data-centric network, said computer server also being configured to

receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication profile database, wherein said single graphical menu comprises at least a first display area for showing a first communication service, and a first communication option associated with said first communication service, and a second display area for showing a second communication service, and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication service and the second communication service are selected from a call forwarding service, a follow me service, an alternate number service, a message alert service, a fax receiving service or a paging service,

a telephony server coupled to exchange data with said communication profile database, said telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center, said telephony server also being configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,263,064 B1
DATED : July 17, 2001
INVENTOR(S) : O'Neal et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 5,
Line 54, "referred" should read -- preferred --.

Column 7,
Line 37, "(PN)" should read -- (VPN) --.

Column 19,
Line 24, "ice" should read -- service --.

Column 20,
Line 34, "service" should read -- services --.

Signed and Sealed this

Seventh Day of May, 2002

Attest:

Attesting Officer

JAMES E. ROGAN
Director of the United States Patent and Trademark Office

EXHIBIT 2

US006728357B2

(12) **United States Patent**
O'Neal et al.

(10) **Patent No.: US 6,728,357 B2**
(45) **Date of Patent: Apr. 27, 2004**

(54) **CENTRALIZED COMMUNICATION CONTROL CENTER AND METHODS THEREFOR**

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(73) Assignee: **Microsoft Corporation**, Redmond, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 483 days.

(21) Appl. No.: **09/907,051**

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Related U.S. Application Data

(63) Continuation of application No. 09/239,585, filed on Jan. 29, 1999, now Pat. No. 6,263,064.

(51) **Int. Cl.**[7] **H04M 3/42**

(52) **U.S. Cl.** **379/201.04**; 379/88.16; 379/88.13; 379/211.03

(58) **Field of Search** 379/88.12–88.17, 379/88.22–88.28, 90.01, 201.01, 201.02, 201.04, 201.12, 211.01–211.03, 212.01, 230, 213.01, 214.01, 217.01, 209.01, 210.01; 370/351–354

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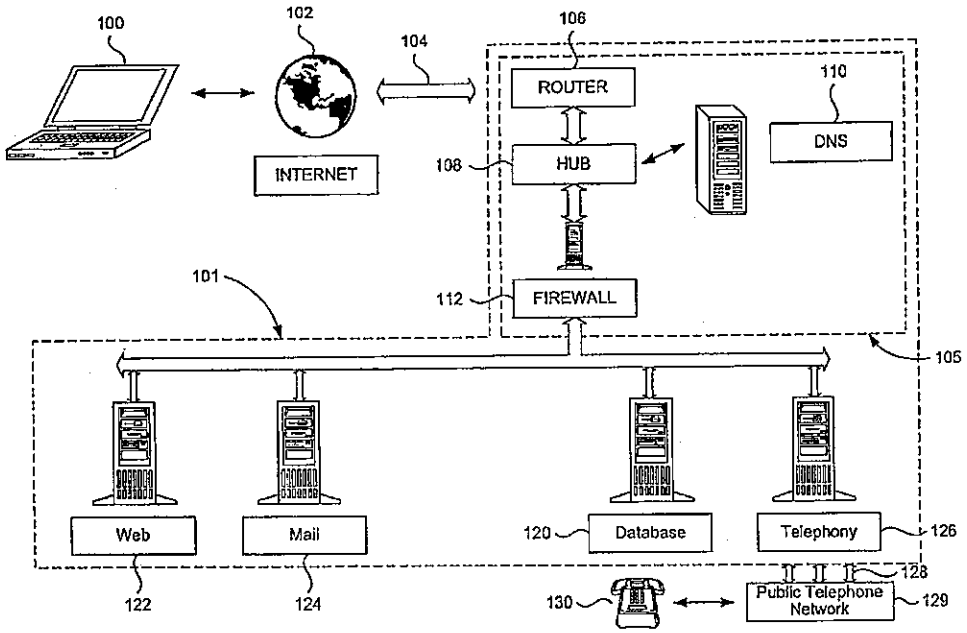
(57) **ABSTRACT**

A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified mess aging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprise a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options are accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network.

18 Claims, 6 Drawing Sheets



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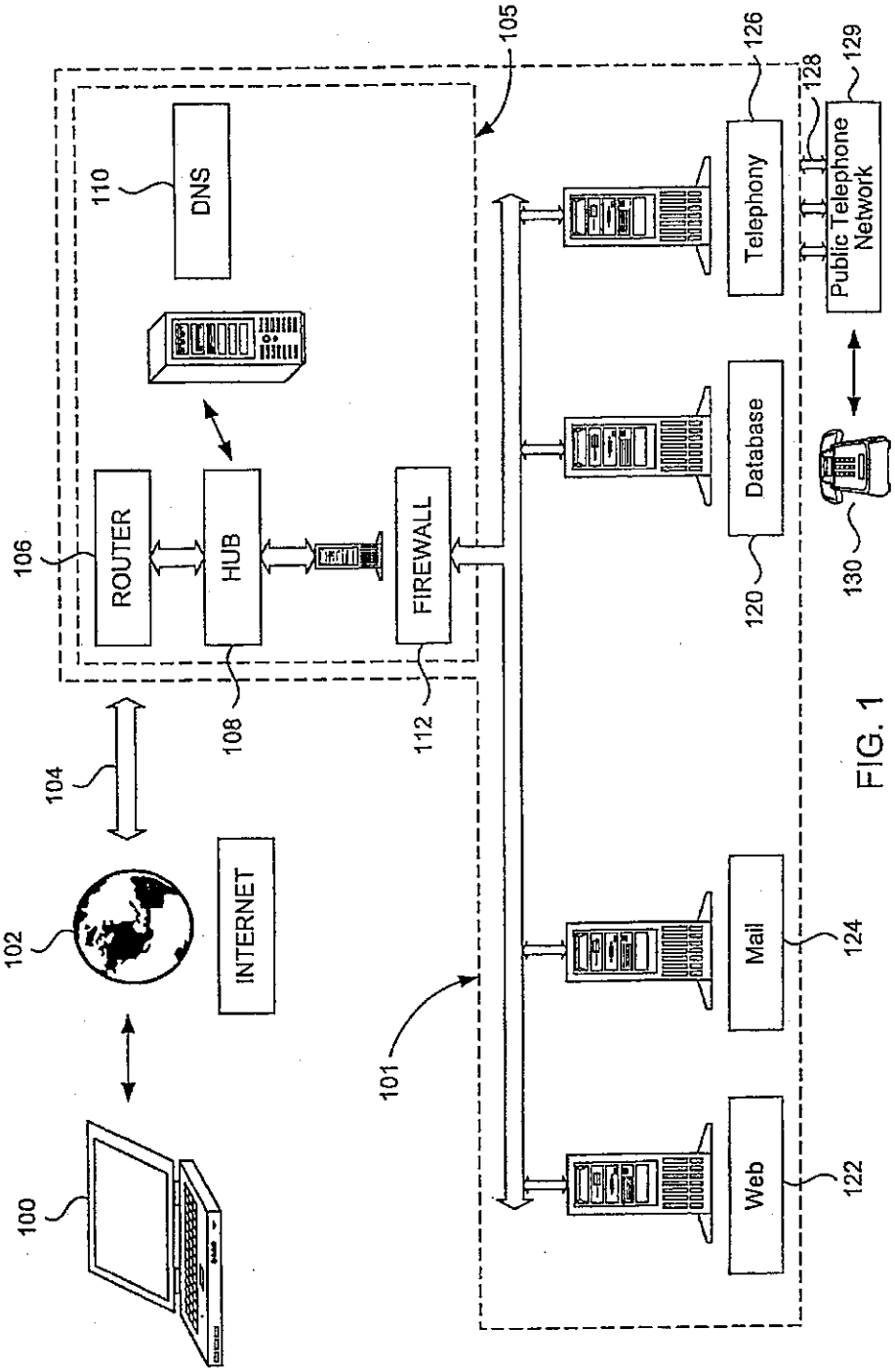

105
126
128
129
DNS
110
Telephony
Public Telephone Network
ROUTER
HUB
FIREWALL
106
Database
120
130
108
112
104
INTERNET
102
101
Mail
124
Web
122
100

FIG. 1

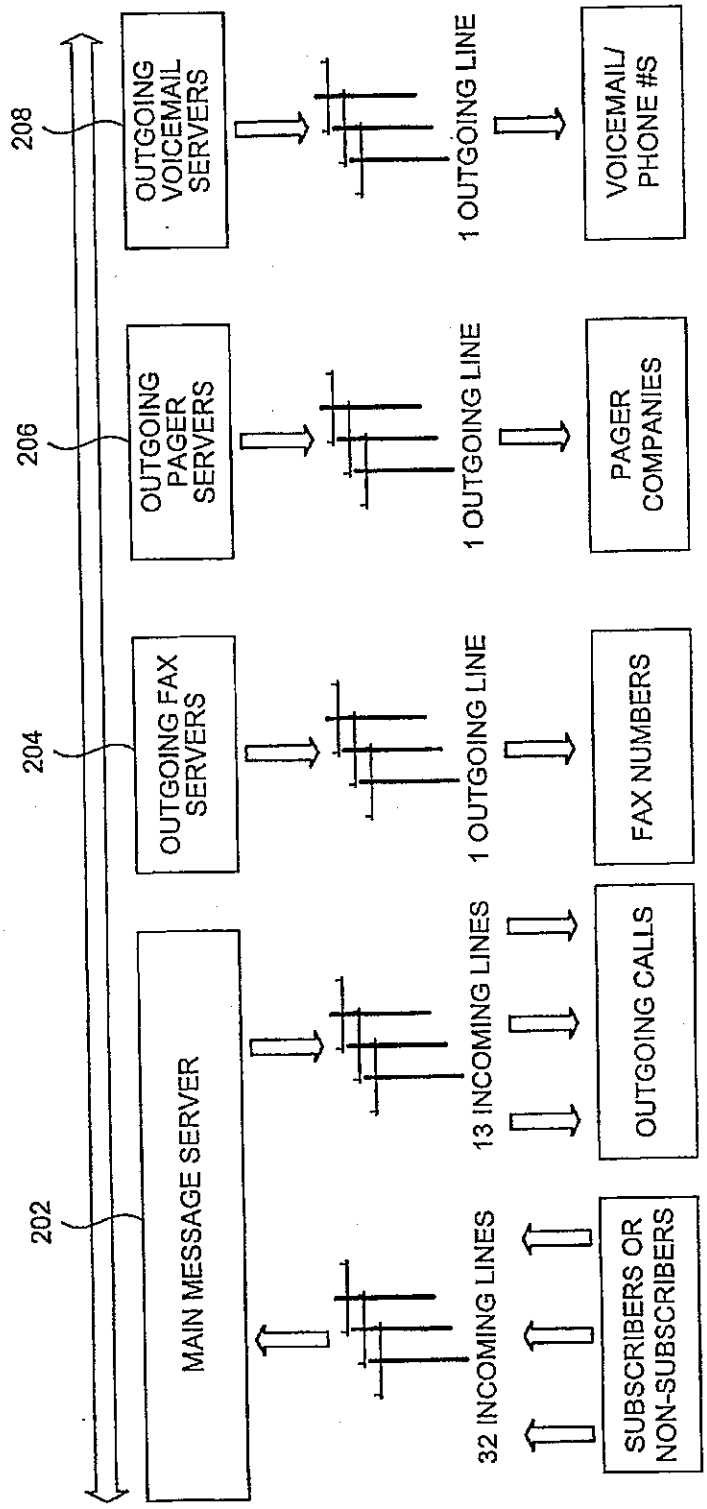

208
206
204
202
OUTGOING VOICEMAIL SERVERS
OUTGOING PAGER SERVERS
OUTGOING FAX SERVERS
MAIN MESSAGE SERVER
1 OUTGOING LINE
1 OUTGOING LINE
1 OUTGOING LINE
13 INCOMING LINES
32 INCOMING LINES
VOICEMAIL/ PHONE #S
PAGER COMPANIES
FAX NUMBERS
OUTGOING CALLS
SUBSCRIBERS OR NON-SUBSCRIBERS

FIG. 2

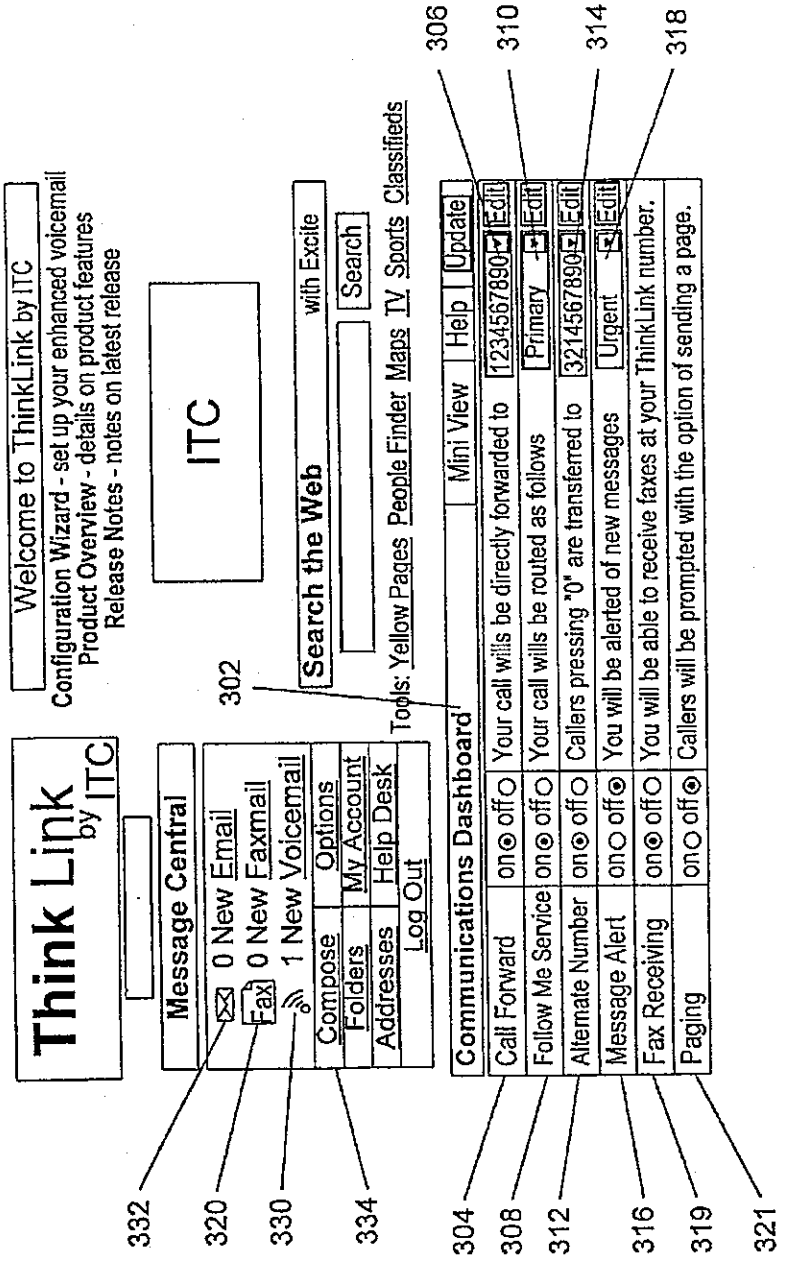

Think Link by ITC
Welcome to ThinkLink by ITC
Configuration Wizard - set up your enhanced voicemail
Product Overview - details on product features
Release Notes - notes on latest release
ITC
302
Search the Web with Excite
Search
Tools: Yellow Pages People Finder Maps TV Sports Classifieds
306
Message Central
0 New Email
0 New Faxmail
1 New Voicemail
Compose Options
Folders My Account
Addresses Help Desk
Log Out
Communications Dashboard
Mini View Help Update
310
314
318
Call Forward on off Your call wills be directly forwarded to 1234567890 Edit
Follow Me Service on off Your call wills be routed as follows Primary Edit
Alternate Number on off Callers pressing "0" are transferred to 3214567890 Edit
Message Alert on off You will be alerted of new messages Urgent Edit
Fax Receiving on off You will be able to receive faxes at your ThinkLink number.
Paging on off Callers will be prompted with the option of sending a page.
332
320
330
334
304
308
312
316
319
321

FIG. 3

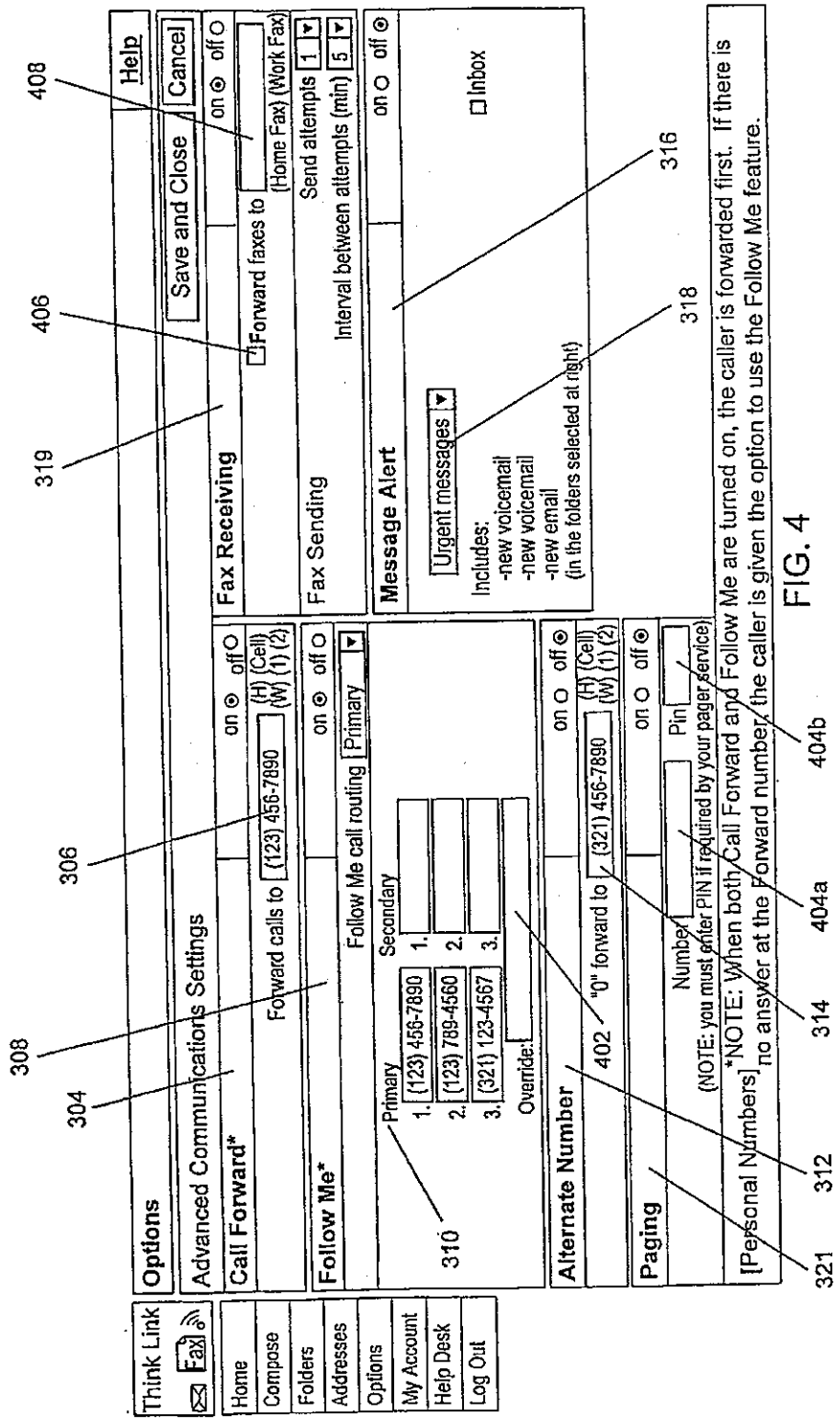

Think Link
Fax
Home
Compose
Folders
Addresses
Options
My Account
Help Desk
Log Out
Options
Help
Cancel
Save and Close
Advanced Communications Settings
Call Forward*
on off
Forward calls to (123) 456-7890 (H) (Cell) (W) (1) (2)
Fax Receiving
on off
Forward faxes to (Home Fax) (Work Fax)
Fax Sending
Send attempts 1
Interval between attempts (min) 5
Message Alert
on off
Urgent messages
Includes:
-new voicemail
-new voicemail
-new email
(in the folders selected at right)
Inbox
Follow Me*
on off
Follow Me call routing Primary
Primary
1. (123) 456-7890
2. (123) 789-4560
3. (321) 123-4567
Secondary
1.
2.
3.
Override:
Alternate Number
on off
"0" forward to (321) 456-7890 (H) (Cell) (W) (1) (2)
Paging
on off
Number
Pin
(NOTE: you must enter PIN if required by your pager service)
[Personal Numbers]
*NOTE: When both Call Forward and Follow Me are turned on, the caller is forwarded first. If there is no answer at the forward number, the caller is given the option to use the Follow Me feature.
308
304
306
408
406
319
316
318
310
402
314
404a
404b
312
321

FIG. 4

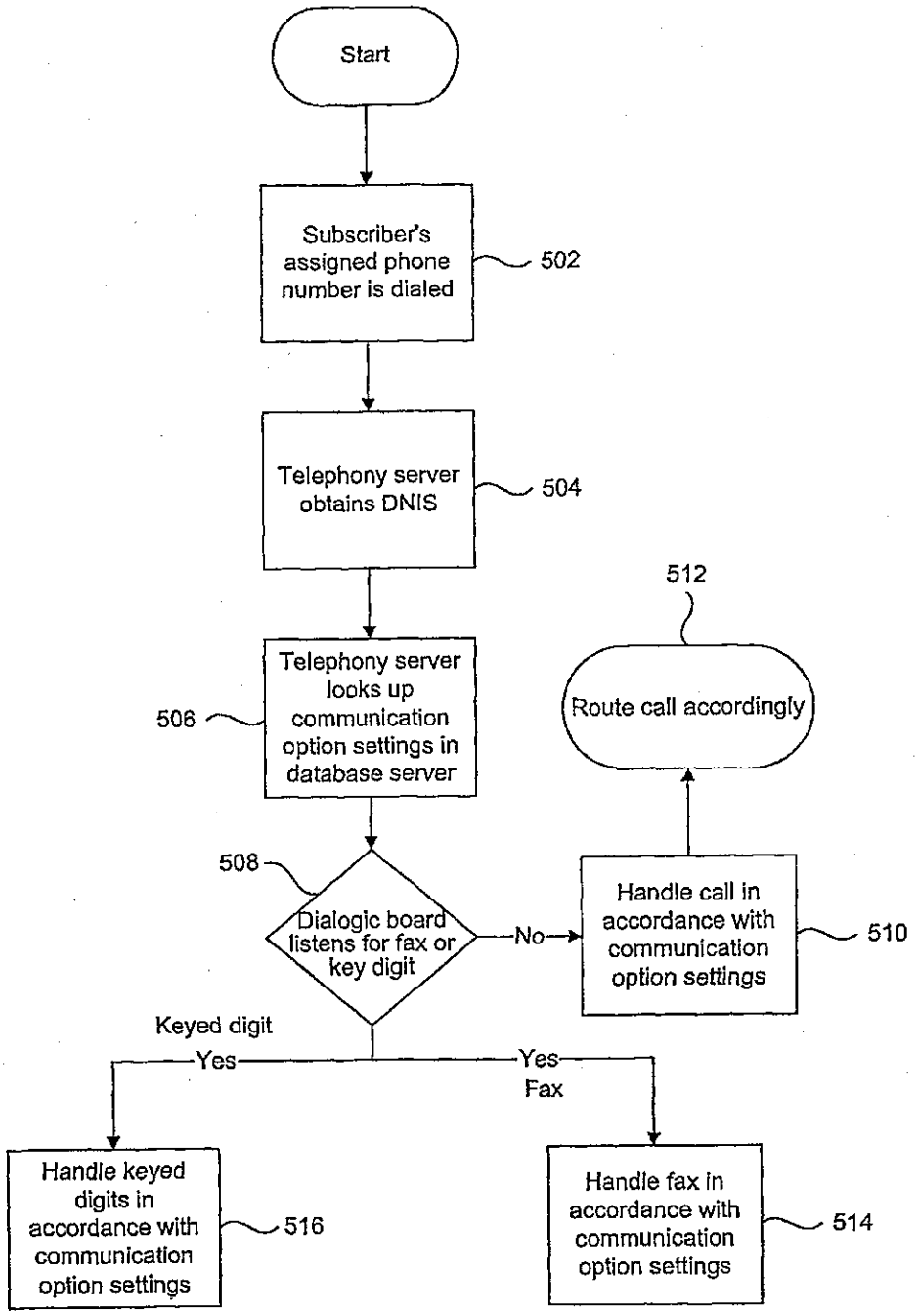

Start
Subscriber's assigned phone number is dialed
502
Telephony server obtains DNIS
504
Telephony server looks up communication option settings in database server
506
508
Dialogic board listens for fax or key digit
No
Handle call in accordance with communication option settings
510
512
Route call accordingly
Keyed digit
Yes
Yes
Fax
Handle keyed digits in accordance with communication option settings
516
Handle fax in accordance with communication option settings
514

FIG. 5

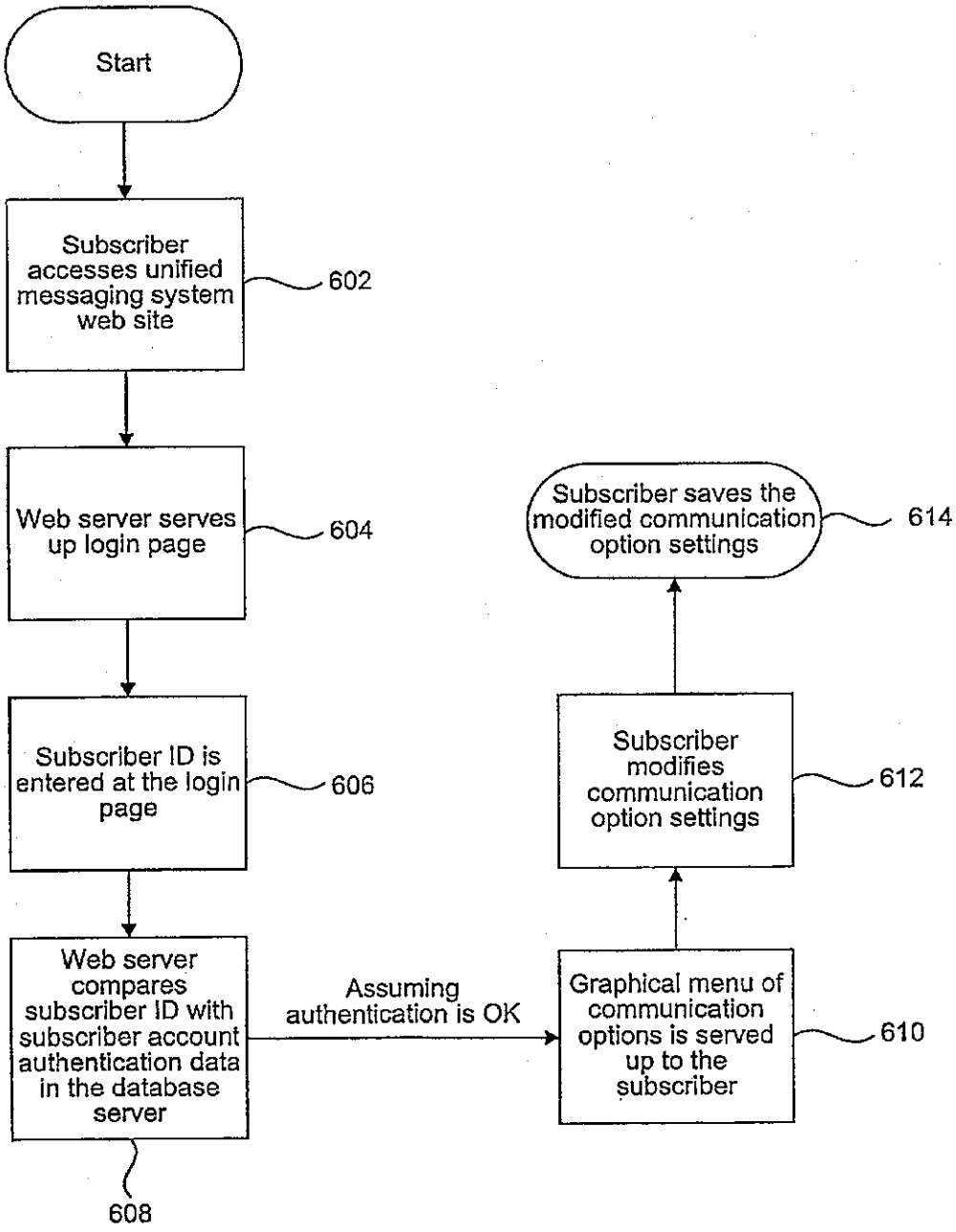

Start
Subscriber accesses unified messaging system web site
602
Web server serves up login page
604
Subscriber ID is entered at the login page
606
Web server compares subscriber ID with subscriber account authentication data in the database server
608
Assuming authentication is OK
Graphical menu of communication options is served up to the subscriber
610
Subscriber modifies communication option settings
612
Subscriber saves the modified communication option settings
614

FIG. 6

CENTRALIZED COMMUNICATION CONTROL CENTER AND METHODS THEREFOR

CROSS REFERENCE TO RELATED APPLICATIONS

The present application is a continuation of U.S. patent application Ser. No. 09/239,585, filed on Jan. 29, 1999, now U.S. Pat. No. 6,263,064.

application Ser. No. 09/239,560, filed Jan. 29, 1999, entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA";

U.S. Pat. No. 6,411,695, issued Jun. 25, 2002, entitled "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITH A THIN WEB BROWSER";

U.S. Pat. No. 6,463,145, issued Oct. 8, 2002, entitled "COMPUTER-IMPLEMENTED CALL FORWARDING OPTIONS AND METHODS THEREFOR IN A UNIFIED MESSAGING SYSTEM";

application Ser. No. 09/240,893, filed Jan. 29, 1999, entitled "INTERACTIVE BILLING SYSTEM UTILIZING A THIN WEB CLIENT INTERFACE";

application Ser. No. 09/240,368, filed Jan. 29, 1999, entitled "A SYSTEM AND METHOD TO MANAGE PHONE SOURCED MESSAGES";

application Ser. No. 09/240,434, filed Jan. 29, 1999, entitled "METHOD AND APPARATUS FOR NETWORK INDEPENDENT INITIATION OF TELEPHONY";

application Ser. No. 09/240,435, filed Jan. 29, 1999, entitled "APPARATUS AND METHOD FOR DEVICE INDEPENDENT MESSAGING NOTIFICATION";

application Ser. No. 09/240,436, filed Jan. 29, 1999, entitled "APPARATUS AND METHOD FOR CHANNEL-TRANSPARENT MULTIMEDIA BROADCAST MESSAGING";

application Ser. No. 09/239,589, filed Jan. 29, 1999, entitled "VOICE ACCESS THROUGH A DATA-CENTRIC NETWORK TO AN INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM".

BACKGROUND OF THE INVENTION

The present invention relates to communication services available via a data-centric network (i.e., a network that carries digital data) and a telephony-centric network (i.e., a network that carries telephony information such as voice, fax, pager, and the like). More particularly, the present invention relates to a centralized facility and methods therefor that allow a subscriber of various communication services to review and customize his communication options, in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

Both the data-centric network (e.g., a distributed computer network) and the telephony-centric network (e.g., public telephone network) have existed for some time. Broadly speaking, the data-centric network (such as the Internet) may be thought of as a global computer network that connects millions of computer terminals all over the world in such a way that digitized information can be exchanged irrespective of the different hardware and software platforms that may be utilized to gain access to the data-centric network. People and businesses around the world use the data-centric network to retrieve information, communicate and conduct business globally, and access a vast array of services and resources on-line. In a similar manner, the telephony-centric network (whether wired or wireless) may also be thought of as another global network that connects the millions of telephony devices (such as voice-oriented telephones, pagers, facsimile machines, voice mail boxes, and the like) together in such a way that a user at one of the telephony devices can readily transmit information to other telephony devices irrespective of geographic boundaries.

In the past, these two networks existed as separate domains. This is because the widely accessible data-centric network is a fairly recent phenomenon. For decades, the only network that has been available to the masses is the analog telephony-centric network, starting with the telegraph network of the nineteenth century. However, as more and more of the services traditionally offered through the telephony-centric network are being offered in a digital format by the data-centric network, the distinction between the data-centric network and the telephony-centric network begins to blur. Irrespective of whether these two networks exist as separate networks physically or conceptually going forward, the legacies of their separate existence can be seen in the various different communication services and communication devices that currently exist.

By way of example, there exist many different communication devices and services available today to allow a person to communicate to another person, e.g., telephones, facsimile machines, electronic mail (e-mail), pagers, voice mail, and the like. Generally speaking, a telephone is a communication device employed to transmit and receive speech and other sounds. A facsimile machine is a communication device to transmit and receive graphical data. A pager is a highly portable device that allows its user to receive data, and in some cases transmit limited data to a pager service provider. A voice mail box is essentially a service that allows one person to temporarily store telephone messages for retrieval by another. E-mail services allow e-mail users to transmit and receive data from computer terminals connected to the data-centric network. All these devices and services are well known in the art and will not be elaborated further for the sake of brevity.

Currently, these communication services are viewed, both by the service providers who create and maintain the network infrastructure and the subscribers who employ the devices and networks for communication, as separate services. This is due, partly but not entirely, to past government deregulation efforts and gradual technological evolution that have given rise to different service providers, all competing to provide the communication services to individual consumers. Thus, it is not unusual for a consumer to have an e-mail account with one service provider, a telephone account with another service provider and a pager account with yet another service provider. Even if the different services are contracted through a single service provider, the dual existence of the data-centric network and the telephony-centric network, as well as existing billing and account management infrastructures, often force the service provider to manage each of these services as a separate account.

One of the consequences of having different accounts for different services is the proliferation of telephone numbers, facsimile numbers, and pager numbers that a typical consumer must deal with. Thus, it is not at all unusual for a consumer to have a home telephone number, a work telephone number, one or more cellular telephone numbers, a pager number, and a facsimile number, with each of these

numbers being assigned to a different communication device. Not only are these various numbers difficult to remember for the consumer, they are confusing to others.

A more serious consequence is the burden on the consumer who needs to manage the communication options associated with the different services (which are now assigned to different physical devices and managed as different accounts) to ensure that incoming and outgoing messages are properly handled. By way of example, a person who travels may wish to forward voice calls made to his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to his office facsimile machine to a facsimile machine that is more local. While in a meeting, however, he may wish to temporarily divert the voice calls to his voice mail box or forward it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time he arrives at a new location.

To accomplish the above, the person in the above example currently needs to first ascertain the current communication option settings associated with the various services that he uses. Unless he is diligent in noting and/or remembering the recent changes in the communication option settings, he may need to call each of the service providers to find out what the current communication option settings are. Assuming that he knows the current communication option settings and such calls need not be made, the user must still access each communication device and/or contact each service provider to reroute the incoming and outgoing messages.

By way of example, some facsimile machines currently allow the user to forward the incoming facsimile to another facsimile machine by entering a particular combination of the forwarding number and predefined codes on the facsimile machine keypad. Likewise, many telephone systems require the user to physically enter the forwarding telephone number and predefined codes on the keypad of the telephone from which forwarding originates. However, this requires the user to be physically present at the facsimile machine or telephone from which forwarding originates. If he owns one of these telephones or facsimile machines and is on the road, such forwarding would not be possible absent help from another person who has such physical access.

The fact that each communication service is treated as a different account also requires the user in the example above to access each account and/or service provider to accomplish the changes. Thus, multiple calls may need to be made to change the communication option settings associated with the different communication services. Even with automated response systems in place to handle such changes, these calls take time and can aggravate even the most patient users, especially if multiple calls need to be made to the multiple service providers each time he moves from one location to another. As can be appreciated by those skilled in the art, such approach is at best time consuming and unwieldy.

More typically, a busy user would just not bother changing the communication options associated with the various communication devices that he owns. He would rather suffer the possibility of missing out on some messages than constantly contacting the different service providers and making changes on individual services. In this case, the communication services that he owns are not employed to their fullest potential.

In view of the forgoing there are desired improved techniques for allowing a user of communication services to review and customize the communication options associated with these services in a simplified and convenient manner.

SUMMARY OF THE INVENTION

The invention relates, in one embodiment, to a computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options is accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The computer-implemented control center includes a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on one of the display terminals when the subscriber employs the one of the display terminals to access the computer-implemented control center. The computer server also is configured to receive from the subscriber via the one of the display terminals a first change to the communication options and to update the first change to the account in the subscriber communication profile database.

There is further included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to one of the telephones when the subscriber employs the one of the telephones to access the computer-implemented control center. The telephony server also is configured to receive from the subscriber via the one of the telephones a second change to the communication options and to update the second change to the account in the subscriber communication profile database.

The invention relates, in another embodiment, to a computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services includes a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options are accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The method includes providing a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included visually displaying the communication options on one of the display terminals, using a computer server coupled to exchange data with the subscriber communication profile database, when the subscriber employs the one of the display terminals to access the computer-implemented control center. There is further included receiving from the subscriber via the one of the

display terminals at the computer server a first change to the communication options. The first change to the communication options pertains to either the voice telephone service or the e-mail service. Additionally, there is included updating the first change to the account in the subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to the subscriber at the unified messaging system, including the voice telephone service, are handled in accordance with the first updated subscriber communication profile database.

These and other features of the present invention will be described in more detail below in the detailed description of the invention and in conjunction with the following figures.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

FIG. 1 depicts, in one embodiment, the general overview of the unified message system.

FIG. 2 illustrates, in one embodiment, how the 48 telephone lines provided per T1 link may be divided among the sub-servers of the telephony server.

FIG. 3, in one embodiment, the user interface portion of the computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer display screen.

FIG. 4 shows the communication options in greater detail, in accordance with one embodiment of the present invention.

FIG. 5 is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unified messaging system through the telephony-centric network by a subscribing or a non-subscribing caller.

FIG. 6 is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system through a computer network by a subscriber.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described in detail with reference to a few preferred embodiments thereof and as illustrated in the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to one skilled in the art, that the present invention may be practiced without some or all of these specific details. In other instances, well known process steps have not been described in detail in order not to unnecessarily obscure the present invention.

In accordance with one aspect of the present invention, there is provided a computer-implemented control center which is coupled to the data-centric network and the telephony-centric network, and which allows a user to access, using either a telephone or a computer, the communication options associated with the various communication services of a unified messaging service. Unlike the prior art approach which requires the user to contact individual service providers/accounts and/or to access individual communication devices to review and change the communication options associated therewith, the computer-implemented control center allows the communication options associated with the various communication services to be accessed substantially all at once. That is, the computer-implemented control center provides a single central facility through which the communication option settings associated with the different communication services may be reviewed and/or modified.

In accordance with one aspect of the present invention, the communication options, which include the options associated with individual communication services as well as routings among the different individual communication services, are accessible using either a computer network interface (e.g., a web page) or a telephone network interface (e.g., via a telephone). The communication option settings themselves do not reside with individual communication devices or require access through a particular communication device (such as with the assigned facsimile machines or telephones discussed earlier). Rather, the communication option settings are centralized within the universally accessible computer-implemented control center and can be utilized to properly control the communication options associated with the various services and to facilitate control of the routings therebetween. More importantly, they can be reviewed and modified by a properly authenticated subscriber of the unified messaging service through any suitable computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

In the aforementioned co-pending patent applications entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA" (application Ser. No. 09/239,560, filed Jan. 29, 1999), and "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITH A THIN WEB BROWSER" (U.S. Pat. No. 6,411,685, issued Jun. 25, 2002), which are all incorporated herein by reference, some inventive unified messaging services and their various features are disclosed. Although the present invention may be implemented on any unified messaging system, reference may be made to the above-mentioned co-pending patent applications for details pertaining to preferable unified messaging systems on which the present invention may be implemented.

In general terms, a unified messaging system benefits a user by integrating various communication services, which up to now have existed as separate services. The integration facilitates simplified management, billing, and more importantly the routing of messages among the various services. With a unified messaging service, a user may, for example, specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, or the like. Within limits, a unified messaging system allows messages to be received, stored, retrieved, and/or forwarded (in the original format or in a different/abbreviated format) without regard to the communication devices and/or networks (i.e., data-centric vs. telephony-centric) employed for the transmission of the messages.

A unified messaging system implemented on a data-centric network takes the unified messaging system concept a step further by internally storing and manipulating the messages in a digital format irrespective of whether the message was received and/or will be sent in the digital or analog format. As is well known, digital formatting increases the flexibility with which information contained in

the messages can be analyzed, stored, manipulated, and/or routed among the various communication devices. More importantly, the implementation of the unified messaging system on a data-centric network permits the subscriber to access his account through any computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

To facilitate discussion, FIG. **1** depicts, in accordance with one embodiment of the present invention, the general overview of a unified message system **101**. With reference to FIG. **1**, there is shown a user computer **100**, representing a computer that may be employed to access and/or modify the communication options associated with the communication services offered by the unified messaging system. Although user computer **100** is shown to be a desktop personal computer (such as an Intel-based personal computer), user computer **100** may in fact represent any computing device capable of accessing the data-centric network (represented by reference **102** in FIG. **1**). By way of example, user computer **100** may represent a laptop computer, which may access the data-centric network either through wired connections or in a wireless manner. As another example, user computer **100** may represent a personal digital assistant (PDA) or a palm-top computer, or a thin-client type computer.

Data-centric network **102** may represent any computer network which couples together users from geographically dispersed locations. In a preferred embodiment, data-centric network **102** represents the Internet, although data-centric network **102** may also represent a Wide Area Network (WAN), a Local Area Network (LAN), a Virtual Private Network (VPN) or any similarly suitable networking arrangement that allows users to log in from a remote terminal.

With reference to FIG. **1**, there is shown data link **104**, representing the high speed data lines for transmitting and receiving data between unified messaging system **101** and data-centric network **102**. In a preferred embodiment, data link **104** is implemented by high speed T1 data lines, although other types of data lines such as fiber optics may also be employed. A network interface system **105** couples data link **104** to the remainder of unified messaging system **101**, which is shown to include four servers as shown (the servers are discussed later herein).

Network interface system **105** represents the interface system that ensures data is properly transmitted and received between unified messaging system **101** and data-centric network **102**. Of course network interface system **105** may vary depending on the implementations of the data-centric network and/or the portion of unified messaging system **101** to which network interface system **105** is coupled.

In the case of the Internet, one current preferred implementation of network interface system **105** may include a router **106**, a hub **108**, a DNS (Domain Name System) facility **110**, and a firewall **112**. Typically, the router **106** is a piece of hardware or software that examines the IP address of data packets and determines the routing of the data packets based on the IP address.

Router **106** acts cooperatively with hub **108** and DNS facility **110** to permit properly addressed data packets to be received through firewall **112**. Router **106**, hub **108**, DNS facility **110**, and firewall **112** are conventional and will not be belabored here for the sake of brevity.

At the heart of the unified message system are a set of servers which are coupled to exchange data and are connected to firewall **112** and the public telephone network. Typically, a server represents a computer that processes data for use by other data-consumer devices (such as other servers, computers or any of the communication devices through a proper interface circuit). There is shown a database server **120**, which is employed to, among other tasks, organize and maintain the subscriber communication profile database. The subscriber communication profile database itself may reside with database server **120** and represents a data store of subscriber accounts and communication option settings associated therewith. Incoming messages to a particular subscriber or outgoing messages from that subscriber are formatted and routed in accordance with the communication option settings stored in the subscriber communication profile database. Properly authorized changes to the communication option settings will be reflected in the communication option settings stored in the subscriber communication profile database and employed to handle subsequent messages (whether incoming or outgoing).

Subscriber authentication data may be employed to access to a subscriber communication profile database. Subscriber authentication data may be stored in the database server. Subscriber authentication may be accomplished using several techniques. For example, a numeric password, an alphanumeric password, a hidden code wherein the password is randomly hidden in a string (i.e., xxxpppxx, xpppxxxx, etc.) and biometrics (e.g., retina scans, hand prints, palm prints, finger prints, voice recognition, etc.).

A web server **122** is employed to facilitate interaction between unified messaging system **101** and data-centric network **102**. Web server **122** represents one of the system-side servers (i.e., a server that handles the exchange of data with the user's computer via the data-centric network) and is employed, for example, to present to user computer **100** the log-in screen when a subscriber employs user computer **100** to access the unified messaging service. Once that subscriber is properly authenticated (e.g., through a password procedure or another suitable authentication procedure), web server **122** then communicates with database server **120** to obtain the current communication option settings for that subscriber and to display the current communication option settings and an individualized web page to the subscriber for review.

In one preferred embodiment, web server **122** is employed to store all messages pertaining to a particular subscriber. The messages are stored as files in web server **122**. These messages may represent, for example, voice files, facsimiles, e-mail messages, voice mail messages, or the like. Pointers in database server **120** facilitate access to the stored messages in web server **122**. However, it is contemplated that the messages may be stored in any of the servers discussed herein and/or in a separate storage device accessible by the servers.

An e-mail server **124** is employed to process incoming and outgoing e-mail messages. By way of example, e-mail server **124** may be employed to format/translate the e-mail messages so that they can be properly transmitted to other e-mail systems and understood thereat. For incoming messages, e-mail server **124** may be employed to format/translate the information transmitted via the incoming e-mail and to prepare them for use by other data consumers.

A telephony server **126** is shown coupled between telephone link **128** and the remainder of the unified messaging system and may include any number of sub-servers, such as are shown in FIG. **2**. In a manner analogous to web server **122**, telephony server **126** represents a systemt-side server (i.e., a telephony server that handles the exchange of infor-

mation with the user via the telephony-centric network) and is employed to facilitate interaction between unified messaging system **101** and telephony-centric network **129**. Telephony server **126** may be employed to, for example, translate the telephone signals (such as the dialed digits) into a digital format for the purpose of authenticating and allowing subscriber access. Telephony server **126** may also be employed to translate such dialed digits and/or other telephone signals (such as a facsimile tones or verbal commands) into digital data, which may then be employed to facilitate handling of messages and/or the communication option settings. In one embodiment, Dialogic board models D 240 SC-T1, D 480 SC-1, CP-4 /SC, CP-6/SC, and/or CP-12/SC (available from Dialogic Corporation of Parsippany, N.J.) are employed to facilitate the translation between telephone signals and digital data. Once translation is performed, software within telephony server **126** employs the digital data to decide how to handle the message using the communication option settings obtained from the subscriber communication profile database. If the subscriber, through predefined dialing sequences, indicates that he wishes to review and/or modify the communication option settings, software within telephony server **126** operates cooperatively with database server **120** to affect the change to the communication option settings. Once the communication option settings are reflected in the subscriber communication profile database stored in database server **120**, the new communication option settings are consulted each time a message needs to be handled by the unified messaging system.

Telephony-centric network **129** represents any telephone network which couples together telephony-type communication devices (e.g., facsimile machines, pagers, telephones) from geographically dispersed locations. By way of example, telephony-centric network **129** may represent a plain old telephone system (POTS), a wired telephone network popularly known as Public Service Telephone Network (PSTN) or a cellular network or a combination thereof. Telephony-centric network **129** is well known and will not be discussed in great detail here for the sake of brevity.

A telephone **130** is shown coupled to telephony-centric network **129**. In reality, it should be understood that a wide variety of telephony devices (which are not shown to simplify the illustration) are connected to telephony-centric network **129**. Some of these exemplary communication devices are, as mentioned, facsimile machines, pagers, cellular telephone sets, wired telephone sets, and the like.

Telephone link **128** represents the telephone communication channels for transmitting and receiving telephone signals between unified messaging system **101** and telephony-centric network **129**. In a preferred embodiment, telephone link **128** represents high bandwidth T1 telephone links, although other types of telephone links may also be employed. Note that there is no requirement that the data transmitted on telephone link **128** be analog. In fact, with the upcoming convergence of data networks and telephone networks, the telephony information that traverses telephone link **128** may well be digital (in which case, telephony server **116** will be adapted to handle digital telephony signals instead of analog telephony signals). As a noteworthy point, it is expected that as data networks and telephone networks converge, the relevant functionality represented by the servers herein may still apply, albeit with the proper modification to handle an all-digital combined data/telephone network.

FIG. **2** illustrates, in accordance with one embodiment of the present invention, how the 48 telephone lines provided per T1 link may be divided among the sub-servers of telephony server **126**. As shown in FIG. **2**, 45 of the telephone lines may be employed by a main message server **202** to handle the incoming/outgoing voice calls, the incoming voice mail messages, and the incoming facsimiles. Of the 45 telephone lines, 32 may be provisioned for the subscribing or non-subscribing users to dial into the unified messaging system, and the other 13 telephone lines may be employed to allow outgoing calls to be made from within the unified messaging system. The outgoing calls may, for example, be calls destined for the unified messaging system but are rerouted out of the unified messaging system in accordance with a subscriber's communication option setting or they may be originated by the subscriber, who dials into the unified messaging system (using a toll-free access number, for example) and requests an outgoing call be made therefrom to some destination number (for example by punching in the "#" key after authentication, followed by the destination number), thus employing the unified messaging system as a type of calling card service.

One of the 48 telephone lines of the T1 link may be reserved for outgoing facsimile transmission, which is handled by an outgoing facsimile server **204**. Another telephone line may be apportioned for the outgoing paging service, which is handled by an outgoing pager server **206**. Outgoing voice-mail messages are handled by voice mail server **208**, which is coupled to another one of the 48 telephone lines of the T1 link as shown.

To elaborate, outgoing voicemails are voice messages sent to a voicemail phone number which may be created via the web or the telephone. Outgoing voicemails may be new voicemails, replies to other messages or forwarded as a voicemail. For example, when forwarding a voicemail via the web, the voicemail may be treated as an attachment to a speech synthesized text message with the recipient address as a telephone number. Outgoing voicemail servers may be geographically distributed and communicate with each other via internet in such a way that the server nearest the destination voicemail phone number may be assigned to send the voicemail via either a circuit-switched call or packet-switched call.

Outgoing facsimiles are facsimile messages sent to a facsimile telephone number which may be created via the web or the telephone. Outgoing facsimiles may be new facsimiles, replies to other messages, forwarded as a facsimile or call-forwarded as a facsimile in which the system stores the incoming facsimile and then forwards the facsimile to the subscriber's facsimile-forward number. For example, when forwarding a facsimile via the web, the facsimile may be treated as an attachment to Tiff conversion of a text message with the recipient address as a phone number. Like outgoing voicemail servers, outgoing facsimile servers may also be geographically distributed. Outgoing facsimile servers may communicate with each other via internet in such a way that the server nearest to the destination facsimile telephone number may be assigned to send the facsimile via either a circuit-switched call or packet-switched call.

Outgoing pages are paging messages sent to a pager number which may be created via the telephone either by the caller or by the system when sending notification. Like outgoing voicemail servers, outgoing page servers may also be geographically distributed. Outgoing page servers may communicate with each other via the internet in such a way that the server nearest to the destination pager telephone number may be assigned to send the page via either a circuit-switched call or packet-switched call.

There may also be outgoing emails and their servers that do not involve circuit switched calls. Some pagers may be

alphanumerical type and can receive messages as an email. In this case, the outgoing pager server may delegate these requests to the outgoing email servers.

In one embodiment, messages sent to the unified messaging system may be stored in web server **122** with pointers to these messages being held in database server **120**. The above mentioned set of sub-servers (outgoing facsimile server, outgoing pager server and outgoing voice mail server) are arranged to make requests to the database server for outgoing messages stored on the web server. If an outgoing message is detected by a sub-server, software within the sub-servers decides how to handle the outgoing message according to the communication option settings obtained from the subscriber communication profile database. Again, a Dialogic board may be employed, in one embodiment, to facilitate the translation between the stored data and the outgoing telephone signal.

All types of outgoing message requests (voicemail, facsimile, email, pages) are queued in the database server. These requests can also be associated with a delivery time (e.g., the default time is "now"). Each type of request may be stored in a separate queue. An outgoing server of a particular type of message periodically checks its queue from the database server to see if any request's time is up for delivery.

It should be noted that FIG. **2** shows only one exemplary way to divide the T1 telephone lines among the various sub-servers of telephony server **126**. Depending on the traffic pattern generated by subscribing and non-subscribing users of the unified messaging system, these lines and sub-servers may be scaled as necessary.

FIG. **3** illustrates, in accordance with one embodiment of the present invention, the user-interface for an exemplary computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer display screen. Through computer-implemented control center **302**, the user may quickly and conveniently review the communication option settings associated with the various services and make changes thereto. That is, the computer-implemented control center **302** serves as the centralized control panel for reviewing and/or customizing the communication options associated with the various communication services. FIG. **4** illustrates aspects of computer-implemented control center **302** in greater detail.

In the exemplary implementation of FIG. **3**, six representative communication options are shown. The call forwarding service **304**, if it is enabled, allows incoming calls through telephony-centric network **129** to be routed to a provided forwarding number **306**. The call forwarding option setting may also be seen in the detailed computer-implemented control center view of FIG. **4**, which shows the communication options in greater detail.

To accomplish the forwarding, telephony server **126** consults, after a call is made to a subscriber's telephone number, the subscriber communication profile database in database server **120**. If the call forwarding option is enabled, that call is then forwarded to the forwarding number specified by telephony server **126** via an outgoing telephone line. If the forwarding number does not pick up, the call may be rerouted, for example, to the subscriber's voice mail box. If the call forwarding option is not enabled and the caller does not choose other methods discussed below to try to contact the subscriber, the call may then be forwarded to the subscriber's voice mail box as well.

The "follow me" service **308** gives the subscriber the ability to designate a set of telephone numbers where he may likely be found and gives the caller the option to try to find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. By way of example, during a work day, a given subscriber may be contacted either at his main office telephone, his secondary office telephone, or his cellular telephone in his car. On the weekend, that same subscriber may be found at home or at a cellular telephone in his boat. The office/car set of telephone numbers may be designated a primary set **310** and the home/boat set of telephone numbers may be designated a second set. FIG. **4** shows the communication options associated with the follow me service in greater detail.

On a week day, the subscriber may enable the follow me service option and select primary set **310** as the set of telephone numbers where he may likely be found. On the weekend, the subscriber may enable the follow me service option and select the secondary set, for example. From the caller's perspective, the follow me service is preferably an on-demand service. That is, the caller is preferably given the option to decide whether to employ the follow me service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice mail if unanswered.

If the follow me service is enabled by the subscriber and chosen by the caller, telephony server **126** will try to place outgoing calls to the numbers designated in the selected set starting with the first number in the set. To ensure that the call is not inadvertently completed vis-a-vis by a bystander who happens to be near the destination telephone and picks up the telephone when it rings, telephony server **126** may allow the caller to record his name. Telephony server **126** then announces the name to the person picking up the destination telephone prior to giving that person a choice of whether to accept the call. If the person who picks up the call is indeed the person for whom the call is intended, the entry of a predefined key press (on instructions by telephony server **126**) on the destination telephone keypad will allow telephony server **126** to complete the end-to-end connection. In this manner, the follow me service may be employed as a call screening mechanism if desired. Telephony server **126** may try all the numbers in the set in sequence until the subscriber is found. If not, the call may be allowed to pass into the subscriber's voice mail box.

In one embodiment, the follow-me service may not always use the same sequence to callout a subscriber when the subscriber has set up several numbers as his possible locations (e.g., weekday routine or weekend and evening routine). The follow-me service may use the number where the subscriber is last located (stored in memory) as the first number to dial in the sequence provided the time for the last location happened within a certain interval (e.g., an hour).

An alternate number service **312** gives the subscriber the ability to designate a telephone number as an alternate number where the caller can attempt to locate the subscriber (or someone who may appropriately handle the incoming call) at a number designated in advance (**314**). FIG. **4** shows the communication options associated with the alternate number service in greater detail. The alternate number option is similar to call forwarding with the exception that the alternate number option is an on-demand service. That is, the caller is preferably given the option to decide whether to employ the alternate number service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice-mail if unanswered. In all other respects, the alternate number service may function in the same way as the call forwarding service. An alternate number may also be used to set a personal operator number (e.g., your secretary).

A message alert option **316** gives the subscriber the ability to select whether to be alerted when a message is received. The message that triggers the alert may be specified using any number of filtering criteria stored as part of the subscriber communication option settings. In the example of FIG. **3**, the filtering criteria is "urgent" **(318)** although any type of filtering may be applied. For example, the filtering criteria could be the message's sender, subject or content. The sender could be identified by his email address or phone number (e.g., caller ID).

FIG. **4** shows, in one embodiment, the communication option settings associated with the unified messaging service in greater detail. With respect to the message alert service, the alerting itself may be accomplished using any of the communication devices controlled by the unified messaging system (e.g., pager, telephone at a designated number, voice mail in a designated voice mail box, facsimile at a designated facsimile number, e-mail at a designated e-mail address, and the like). In accordance with one particularly advantageous embodiment, the message alert is sent to a pager via outgoing pager sub-server **206** since it is the device most likely to be near the subscriber. In one embodiment, the server that sends the alert (e.g., the web server if the incoming message is an e-mail, the telephony server if the incoming message is a facsimile or telephone call) may send out a predefined alphanumeric code that identifies the type of incoming message. The alphanumeric code itself may be predefined either by the unified messaging system or by the subscriber if customization is desired. Preferably, the alert is sent to the subscriber's own number to alert the subscriber that an incoming message fitting the filtering criteria has been received at the unified messaging system.

A facsimile receiving service **319** allows the user to receive facsimile at the unified messaging system if someone sends a facsimile to the subscriber's telephone number. FIG. **4** shows the communication options associated with the facsimile receiving service in greater detail. If the facsimile receiving option is enabled, telephony server **126** will monitor for the facsimile tone and process the incoming message as a facsimile if the facsimile tone is detected. In one embodiment, the incoming facsimile is stored as a GIF or TIFF file that may be viewed by the subscriber through a web page by clicking on facsimile mail link **320**. If the facsimile forward option **406** is also enabled, the facsimile will also be forwarded by the outgoing facsimile server **204** to another facsimile machine at specified facsimile number **408**, additionally or alternatively to storing a copy of the received facsimile at the unified messaging service. If the facsimile option is not enabled but the call forwarding option is enabled, the call is forwarded on and may be picked up by the forwarded device (if it is a functioning facsimile machine). If not, the incoming facsimile will not be received.

A paging service **321** allows a message sent to the subscriber to be rerouted to a pager designated by the subscriber. Paging service **321** is preferably an on-demand service and allows the caller, if desired, to send a short message to a pager designated by the subscriber. The pager number designated by the subscriber may be designated at location **404***a* (the paging service number) and, if required, using location **404***b* (the PIN number for the pager). If the paging service is enabled, a caller to the subscriber's telephone number will be given an option to send a short message to the pager subscriber pager (for example, by pressing a predefined key to send the short message). As noted before, the caller may also choose any of the other services follow me service **308** and/or alternate number **312** if enabled. In this manner, a single telephone number may serve as the access point to receive a page, a voice message, a facsimile, etc.

For alphanumeric pagers with an email address, the outgoing page server may use text to describe the alert message (e.g., "you have a urgent voicemail from caller ID 4152222222 with return number 4153333333") instead of codes as in the case of numeric pagers. The outgoing pager server can then delegate the alert messages to the outgoing email server.

Voice mail messages that are stored may be listened to using either the computer (through an appropriate software/sound card) by clicking on voice mail link **330** (FIG. **3**) or a telephone coupled to the telephony-centric network. E-mails that are sent to the subscriber using the subscriber's e-mail address may be read on-line by, for example, clicking on e-mail link **332** (FIG. **3**). In one embodiment, telephone server **126** may be equipped with a text-to-speech facility to allow the subscriber to listen to the content of the e-mail message through a telephone. FIG. **3** also shows an outgoing e-mail link **334**, which links the subscriber to an e-mail application program to allow the subscriber to compose and send out e-mail messages. In the case of replying an email via phone, a voice recording may be taken and sent as an email attachment.

As can be appreciated from the above examples, computer-implemented control center **302** provides a central visual interface that allows a subscriber to efficiently review and/or modify the communication option settings associated with the various communication services offered. This is in sharp contrast with time-consuming and burdensome prior art approaches whereby the person is required to contact different entities and deal with different accounts to change the communication options associated with different communication services.

In one embodiment, the computer-implemented control center has two views:

the minimized view and the full view. In the minimized view (e.g., FIG. **3** in one embodiment), the computer-implemented control center may simply show the simplified routing details and the on-off settings associated with the communication options. Although the user may make changes to the on-off settings, fuller edit capabilities are preferably provided in the full view. In the full view (e.g., FIG. **4** in one embodiment), the computer-implemented control center additionally add explanations and detailed routing choices. If desired, an authentication procedure may be implemented with either the minimized view or the full view to ensure that the person making editing changes to the communication options is properly authorized.

It should be appreciated that the communication services and options discussed in connection with FIGS. **3** and **4** are only illustrative of the capabilities of the inventive computer-implemented control center. It should be apparent to those skilled in the art that the same control panel may be presented to the subscriber through the telephony server and the telephone interface if the subscriber wishes to review and/or change the communication options using a telephone connected to the telephony-centric network. The communication options may be presented in a sound format and the subscriber may be offered an option menu to review and/or change any communication option setting. Further, it should also be apparent to those skilled in the art that communication services options other than the preferred and discussed communication services and options can readily be controlled by the inventive computer-implemented control cen-

ter. Irrespective of the services and options involved, a subscriber can access the centralized computer-implemented control center through either a computer connected to the data-centric network or a telephone connected to the telephony-centric network to review and/or change the communication options.

FIG. 5 is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unified messaging system through the telephony-centric network by a subscribing or a non-subscribing caller. The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages or e-mail messages, to use the unified messaging system as a calling card service, or to review and/or modify the communication options. A non-subscribing caller may access the unified messaging system to, for example, send a facsimile, a page, or to call the subscriber. The first step **502** involves accessing the unified message system through a telephone using the subscriber's assigned telephone number. A set of two numbers may be assigned to a user, a local telephone number and a toll-free telephone number, both of which may be associated with a single user account.

The dialed digits reaches telephony server **126** via telephone link **128**. Telephony server **126** then obtains the DNIS (direct number information service) by digitizing the dialed digits (step **504**) and employs the dialed digits to obtain the communication option settings associated with the account represented by the dialed telephone number (step **506**). As mentioned earlier, these communication option settings reside in the subscriber communication profile database, which may be managed by database server **120**, in one embodiment. During this time, telephone server **126**, through an appropriate interface board such as the aforementioned Dialogic board, monitors the incoming line for a facsimile tone or telephone key digit tone.

If no such facsimile tone or telephone key digit tone is detected (step **508**), the call is assumed to be a normal call to the subscriber and will be handled (in steps **510** and **512**) in accordance with the communication option settings in the manner discussed earlier (e.g., forwarded if call forwarding is on, routed to an alternate number if the caller selects that option and alternate service is enabled, and the like).

On the other hand, if a facsimile tone is detected by telephony server **126**, the call will be handled as an incoming facsimile in accordance with the communication option settings (step **514**). By way of example, if the facsimile receiving service is enabled, a copy of the facsimile will be stored for later retrieval by the subscriber. If the facsimile forwarding option is enabled, a copy of the facsimile is alternatively or additionally sent to the forwarded facsimile number.

On the other hand, if a keyed digit tone is detected by telephony server **126**, software within telephony server will handle the options chosen by the caller (step **516**). By way of example, one option may represent the subscriber wishing to access the computer-implemented control center (via an appropriate key press) to review and/or chance the communication options. In this case, telephony server **126** preferably serves up the account statistics, e.g., how many voice mail messages, facsimiles, e-mail messages, etc. are waiting and asks the caller for authentication as a subscriber. If there are none, the subscriber may wish to quickly hang up and not go through the authentication procedure (and extending the cost of the call). This, however, is an option and may be eliminated if privacy is a concern (that is, authentication may take place before the presentation of account statistics).

Telephony server **126** may then obtain the authentication data from the caller (e.g., the password) and compare it with the subscriber account authentication data, which it obtains from the subscriber communication profile database in the database server. Authentication may be done via keyed digit entry or, in one embodiment, by voice commands, which may then be translated to keyed digits by appropriate software. If authenticated, the subscriber may then be presented with a menu that allows the subscriber to review and/or change the communication options via key press or voice commands. Once the subscriber saves the changes, the changed communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

As one of the options, the subscriber may be given a choice (with proper authentication) to use the unified messaging system to originate an outgoing call. The choice may be made via, for example, a predefined key press or voice command. This is useful in situations wherein the subscriber accesses his account at the unified messaging system through his toll-free number (e.g., from the airport or from someone else's telephone) and instructs the telephony server to connect his incoming call to an outgoing call to a provided destination telephone number and charges the cost to his account. In this manner, the unified messaging system may be employed as a convenient calling card.

A keyed digit may also represent an on-demand service selection chosen by the caller. In this case, the caller simply presses an appropriate key when prompted and employs one of the on-demand services is then employed to handle his call. Various on-demand services have been discussed in connection with FIGS. **3** and **4** and will not be repeated here for the sake of brevity.

FIG. **6** is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system by a subscriber through a data-centric network (such as the Internet in the example of FIG. **6**). The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages, view stored e-mail messages or facsimiles, send e-mail messages or facsimiles, or to review and/or modify the communication options. The first step **602** involves accessing the unified messaging system web site, using a unified messaging system web address (e.g., "unifiedmessagingsystem.com"), with user computer **100** through a data-centric network **102**.

The web site request connects to the web server **122** via data link **104** and network interface system **105**. Following connection to the web site, the unified messaging system web server **122** serves up a login page using, for example, ASP-active server pages (step **604**). The next step (step **606**) includes entering authentication data such as a subscriber identifier (ID), e.g., username and password, at the login page. The web server **122**, after obtaining the authentication data, compares it with the subscriber account authentication data (step **608**), which it obtains from the subscriber communication profile database from the database server. If authenticated, the subscriber may then be presented with a graphical menu of the communication options (step **610**) that allows the subscriber to retrieve his email/voicemail/fax messages, or review and/or modify the communication options via user computer **100** (step **612**). Once the subscriber saves the changes (step **614**), the modified communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

Accordingly, the present invention provides a single centralized facility that gives a subscriber of various communication services (e.g., telephone, facsimile, pager, e-mail) the ability to review and modify his communication options (e.g., call forwarding, follow me service, alternate number, message alert, facsimile receiving, paging, routings and the like). This review and modification is done in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

The unified messaging system benefits a subscriber by integrating various communication services which up to now have existed as separate services. This is in sharp contrast to the prior art where the dual existence of the data-centric network and the telephony-centric network has forced the service providers to manage communication options as separate accounts.

This integration simplifies management, billing, and more importantly the routing of messages among the various services. The unified messaging system gives the subscriber more control with regards to how the world communicates to the subscriber. For example, a subscriber may specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, etc. The unified messaging system allows messages to be received, stored, retrieved, and/or forwarded without regard to the communication devices and/or networks employed for the transmission of the messages. In fact, the unified messaging system even gives non-subscribers choices with its on-demand services associated with some of the communication options.

The unified messaging system advantageously removes the burden of managing different physical devices and different accounts. The subscriber no longer has to access multiple accounts to modify options. As mentioned previously, a person who travels may wish to forward calls made from his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to an office facsimile machine to a facsimile machine that is more local. While in a meeting, however, one may wish to temporarily divert the voice calls to a voice mail box or forwards it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time one arrives at a new location.

Using the present invention, a person need only access the unified messaging system either with a telephone or a computer. The communication options may then be modified as needed with a few key strokes. The subscriber has the ability to review communication options at a single facility and no longer has to recall communication options from memory or contact each service provider.

Furthermore, the present invention advantageously allows remote access to the unified messaging system from any location that is connected to the data-centric network or the telephony-centric network. The subscriber no longer has to be physically present at the forwarding origin to modify the forwarding option. This advantage leads to yet another advantage in that the unified messaging system may be used as a calling card. The subscriber if located at the airport, for example, contacts his unified messaging system toll-free telephone number. The system then allows the subscriber the option of rerouting this call to another location.

Also, the present invention advantageously allows the subscriber the convenience of one telephone number (or two, including a toll-free 800 number). Multiple number confusion is avoided by connecting multiple numbers through the one number of the unified messaging system.

While this invention has been described in terms of several preferred embodiments, there are alterations, permutations, and equivalents which fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. A computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said method comprising:

providing a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber;

generating a single graphical menu for displaying said communication options for each of said communication services at the same time, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option included a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service;

visually displaying said single graphical menu on one of said display terminals, using a computer server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computer-implemented control center;

providing a telephony server coupled to exchange data with said communication profile database;

audibly representing said communication options to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center;

receiving from said subscriber via said one of said display terminals at said computer server a first change to at least one of said communication options, said first change to said communication options pertains to either said voice telephone service or said e-mail service; and

updating said first change to said account in said subscriber communication profile database, thereby result-

ing in a first updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

2. The computer-implemented method of claim 1 further comprising:

receiving at said telephony server from said subscriber via said one of said telephones a second change to at least one of said communication options; and

updating said second change to said account in said subscriber communication profile database, thereby resulting in a second updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said e-mail service are handled in accordance with said updated subscriber communication profile database.

3. The computer-implemented method of claim 2 wherein said facsimile and said voice telephone service are both implemented using a single telephone number.

4. The computer-implemented method of claim 1 wherein said plurality of communication set-vices include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephony-centric network and said telephony server, said communication options including a facsimile receiving enable option associated with said facsimile service.

5. The computer-implemented method of claim 1 further comprising:

providing a pager server coupled to exchange data with said communication profile database, wherein said communication services further include a pager alert service and wherein said communication options further include a pager alert option, said pager server being configured to transmit, when said pager alert option is enabled, an alert to a pager through said telephony-centric network if an e-mail message is received by said subscriber through said data-centric network, said pager having a page number that is also specified as part of said pager alert option.

6. The computer-implemented method of claim 1 wherein said plurality of communication services include a call forwarding service configured to permit said subscriber to specify whether a call received at a telephone number associated with said account be forwarded to a forwarding telephone number, said communication options including a call forwarding enable option and said forwarding telephone number.

7. The computer-implemented method of claim 1 wherein said plurality of communication services include an alternate number service, said communication options including an alternate number service enable option associated with said alternate number service and an alternate telephone number, said alternate number service enable option, when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to an alternate telephone associated with said alternate telephone number.

8. The computer-implemented method of claim 1 wherein said plurality of communication services include a follow-me service, said communication options including a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers.

9. The computer-implemented method of claim 8 wherein said follow-me service is configured to ring in sequence each one of said telephones associated with said set of telephone numbers until said call by said caller is accepted.

10. The computer-implemented method of claim 9 wherein said follow-me service is configured to ring first a last-found telephone number, said last-found telephone number representing a telephone number associated with a phone previously employed by said subscriber to answer an immediately preceding call to said subscriber.

11. The computer-implemented method of claim 8 wherein said single graphical menu comprises at least:

a first display area for showing said on-demand communication service, said on-demand communication enable option, and said forwarding number.

12. The computer-implemented method of claim 11 wherein said single graphical menu further comprises:

a second display area for showing a second communication service, and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu.

13. The computer-implemented method of claim 12 wherein said on-demand communication service is selected from a follow-me service, an alternate number service, and a paging service, and wherein said second communication service is selected from a call forwarding service, a follow-me service, an alternate number service, a message alert service, a fax receiving service, and a paging service.

14. The computer-implemented method of claim 12 wherein the second communication option includes a second enable option for enabling or disabling the second communication service.

15. The computer-implemented method of claim 14 wherein the second communication option includes a routing option.

16. The computer-implemented method of claim 15 wherein the forwarding number includes a plurality of numbers, and wherein the second routing option includes a plurality of routings.

17. A data structure for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said data structure for use with:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber; said data structure comprising:

a single graphical menu for displaying said communication options for each of said communication services at the name time, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first

communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service;

said single graphical menu capable of being displayed on one of said display terminals using a computer server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computer-implemented control center;

wherein a telephony server is coupled to exchange data with said communication profile database;

an audible representation of said communication options capable of being provided to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center;

a first change to at least one of said communication options received from said subscriber via said one of said display terminals at said computer server, said first change to said communication options pertaining to either said voice telephone service or said e-mail service;

wherein said first change is updated to said account in said subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, and wherein subsequent messages to said subscriber at said unified massaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

18. A computer readable media including instructions for a computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said instructions comprising;

providing a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber;

generating a single graphical menu for displaying said communication options for each of said communication services at the same time, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service;

visually displaying said single graphical menu on one of said display terminals, using a computer server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computer-implemented control center;

providing a telephony server coupled to exchange data with said communication profile database;

audibly representing said communication options to one of said telephones, using said telephony eerier, when said subscriber employs said one of said telephones to access said computer-implemented control center;

receiving from said subscriber via said one of said display terminals at said computer server a first change to at least one of said communication options, said first change to said communication options pertains to either said voice telephone service or said e-mail service; and

updating said first change to said account in said subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,728,357 B2
DATED : April 27, 2004
INVENTOR(S) : Stephen O'Neal

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1,
Line 15, delete "6,411,695" and insert -- 6,411,685 --.

Column 15,
Line 58, delete "chance" and insert -- change --.

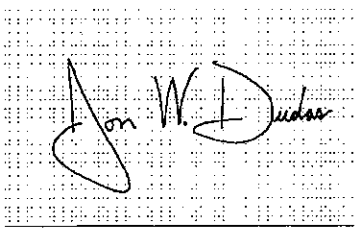
Column 19,
Line 24, delete "set-vices" and insert -- services --.

Column 20,
Line 65, delete "name" and insert -- same --.

Column 22,
Line 36, delete "eerier" and insert -- server --.

Signed and Sealed this

Twenty-eighth Day of June, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office

EXHIBIT 3

US006430289B1

(12) **United States Patent**
Liffick

(10) **Patent No.: US 6,430,289 B1**
(45) **Date of Patent: Aug. 6, 2002**

(54) **SYSTEM AND METHOD FOR COMPUTERIZED STATUS MONITOR AND USE IN A TELEPHONE NETWORK**

(75) Inventor: **Stephen Mitchell Liffick**, Seattle, WA (US)

(73) Assignee: **Microsoft Corporation**, Redmond, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/291,693**

(22) Filed: **Apr. 13, 1999**

(51) **Int. Cl.**[7] **H04M 1/00**
(52) **U.S. Cl.** **379/900**; 379/142.15; 370/352
(58) **Field of Search** 379/201.06, 209.07, 379/201.08, 201.1, 210.11, 142.15, 196, 197, 198, 199, 900; 370/352, 353, 354

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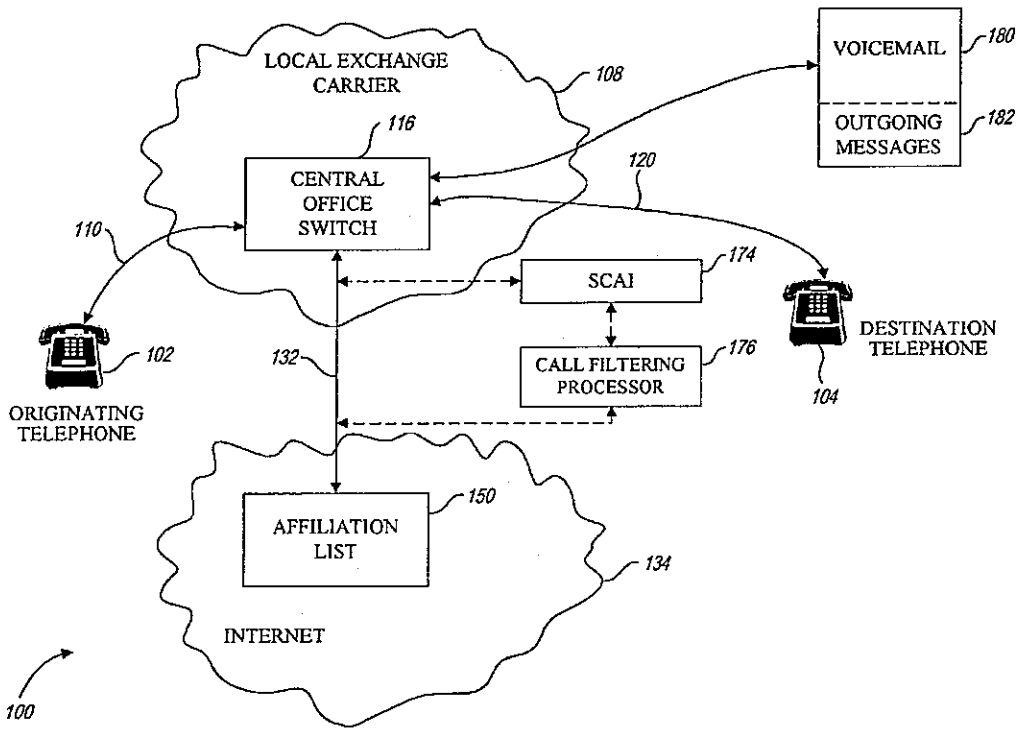
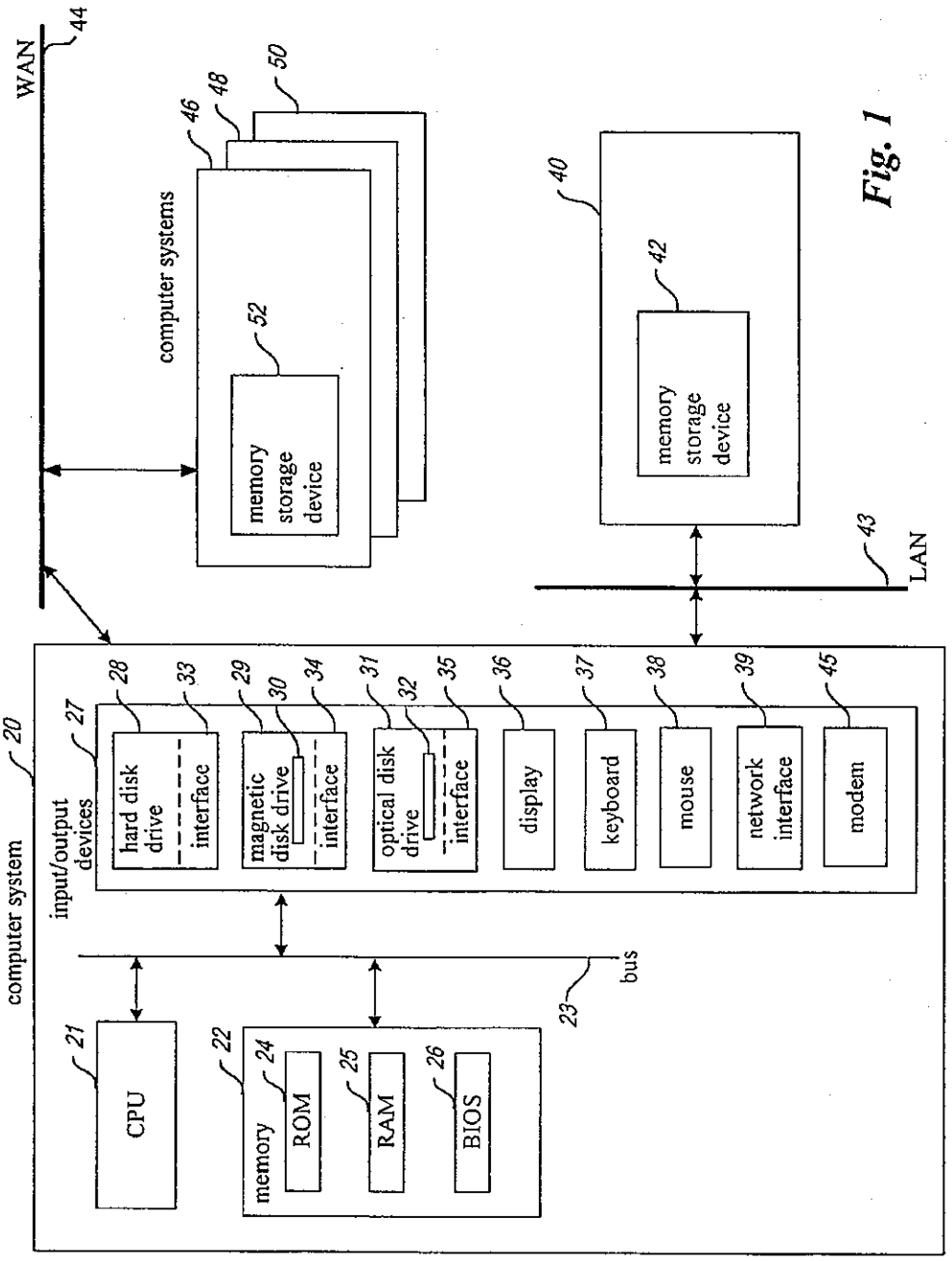
Primary Examiner—Craighton Smith
(74) *Attorney, Agent, or Firm*—Workman, Nydegger, Seeley

(57) **ABSTRACT**

A telecommunication system combines telephone technology and computer. network technology to monitor a caller and callee's computer activity and to access call processing criteria selected by the caller and callee and stored on the computer network. A component of the telephone system, such as a central office switch, accesses the caller and callee call processing criteria. The system evaluates the call processing criteria and, when conditions for both caller and callee are met, the telephone system initiates a telephone call between the caller and callee. The call processing criteria may include accepting all calls, no calls, or calls only from specified parties. In addition, the call processing criteria can vary in accordance with the time of day or an individual's personal preferences, or status, such as when an individual is in a meeting. A user's computer activity may also be monitored and the computer status as idle or active may be reported to the computer network as part of the call processing criteria.

20 Claims, 10 Drawing Sheets

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LAN
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computer system
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hard disk drive
interface
33
29
magnetic disk drive
30
interface
34
31
optical disk drive
32
interface
35
36
display
37
keyboard
38
mouse
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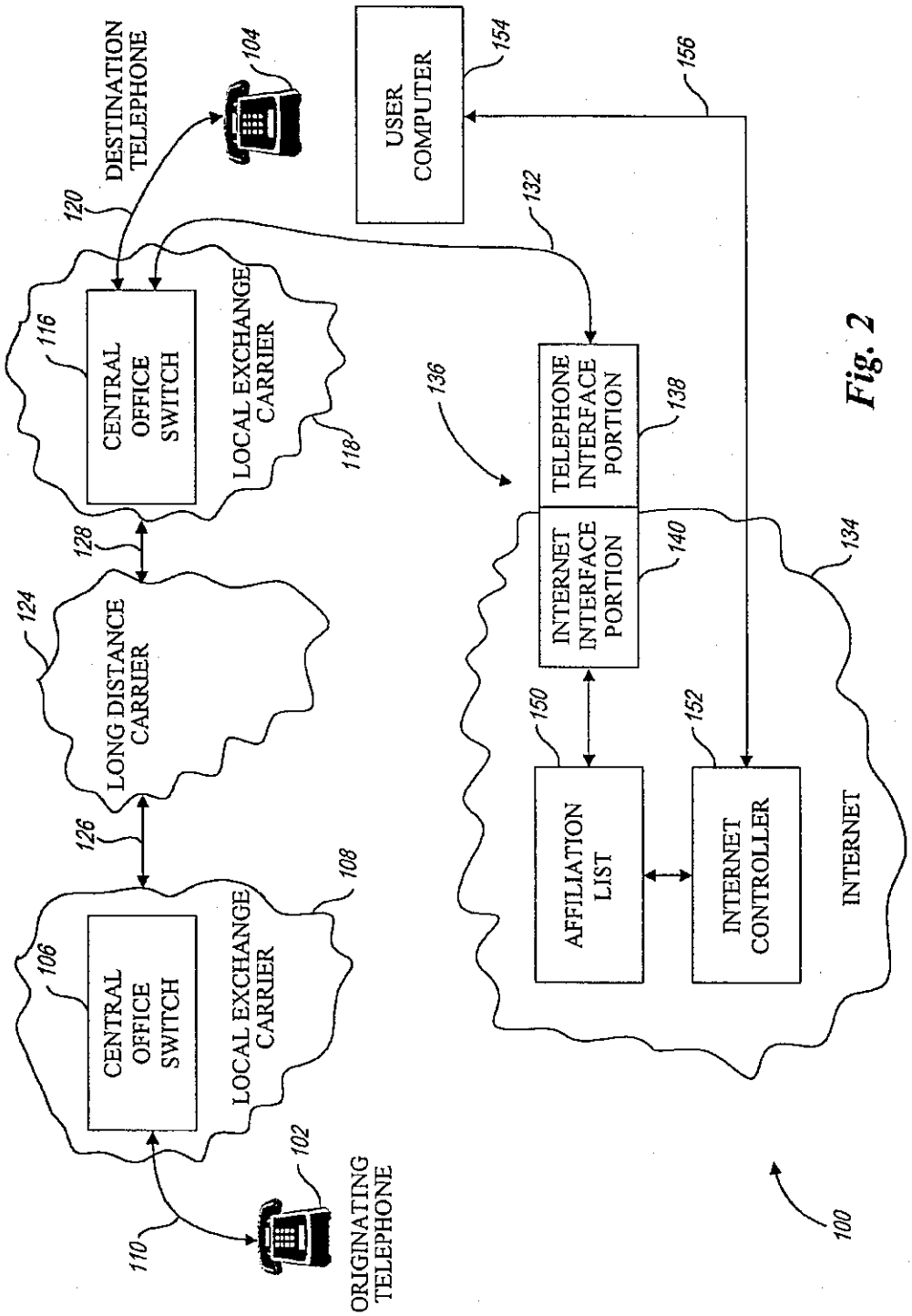
CPU
22
memory
24
ROM
25
RAM
26
BIOS

Fig. 1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USER COMPUTER
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132
CENTRAL OFFICE SWITCH
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LOCAL EXCHANGE CARRIER
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TELEPHONE INTERFACE PORTION
138
128
INTERNET INTERFACE PORTION
140
134
124
LONG DISTANCE CARRIER
126
150
152
AFFILIATION LIST
INTERNET CONTROLLER
INTERNET
CENTRAL OFFICE SWITCH
106
LOCAL EXCHANGE CARRIER
108
102
ORIGINATING TELEPHONE
110
100

Fig. 2

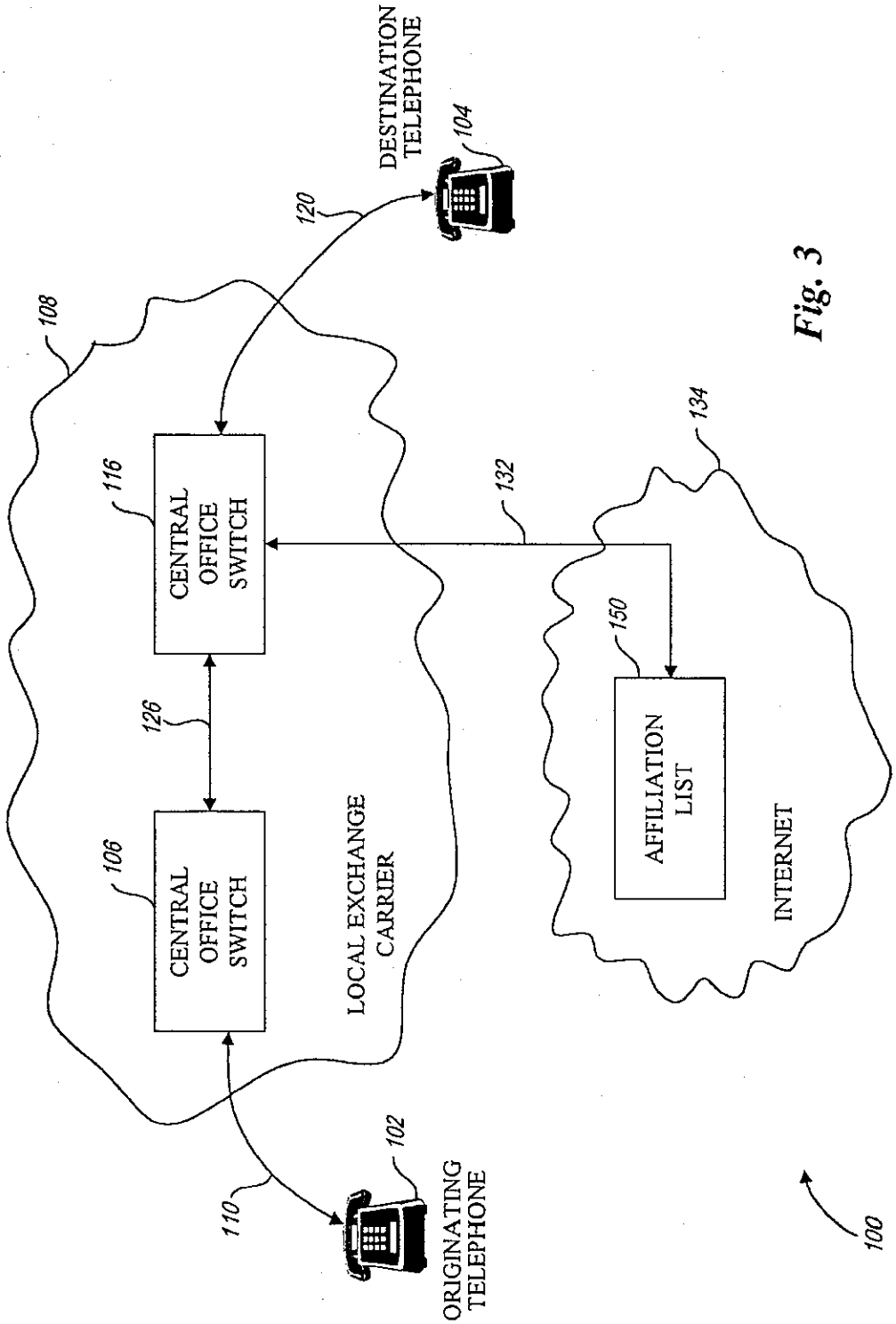
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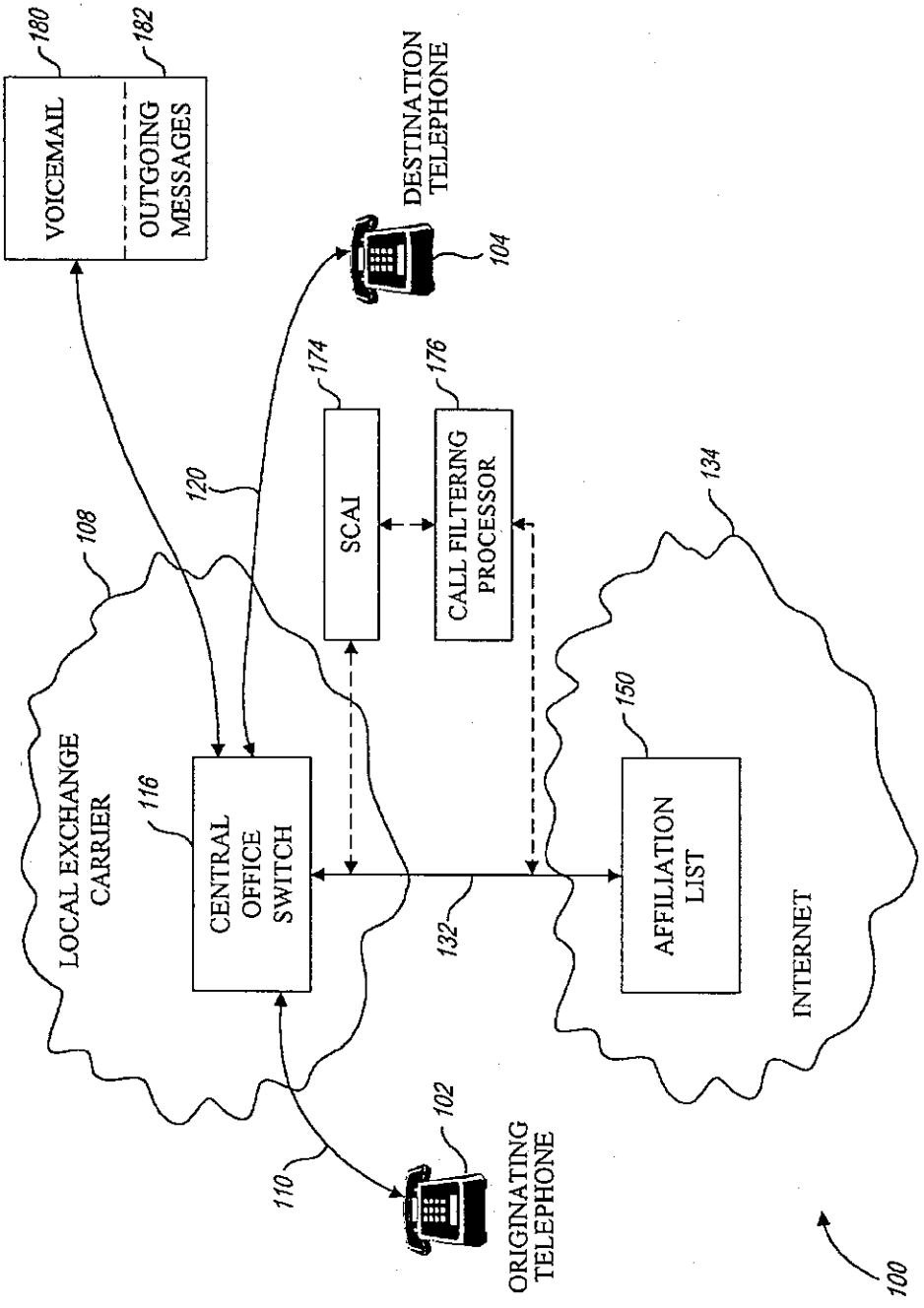
Fig. 3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SCAI
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134
LOCAL EXCHANGE CARRIER
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INTERNET
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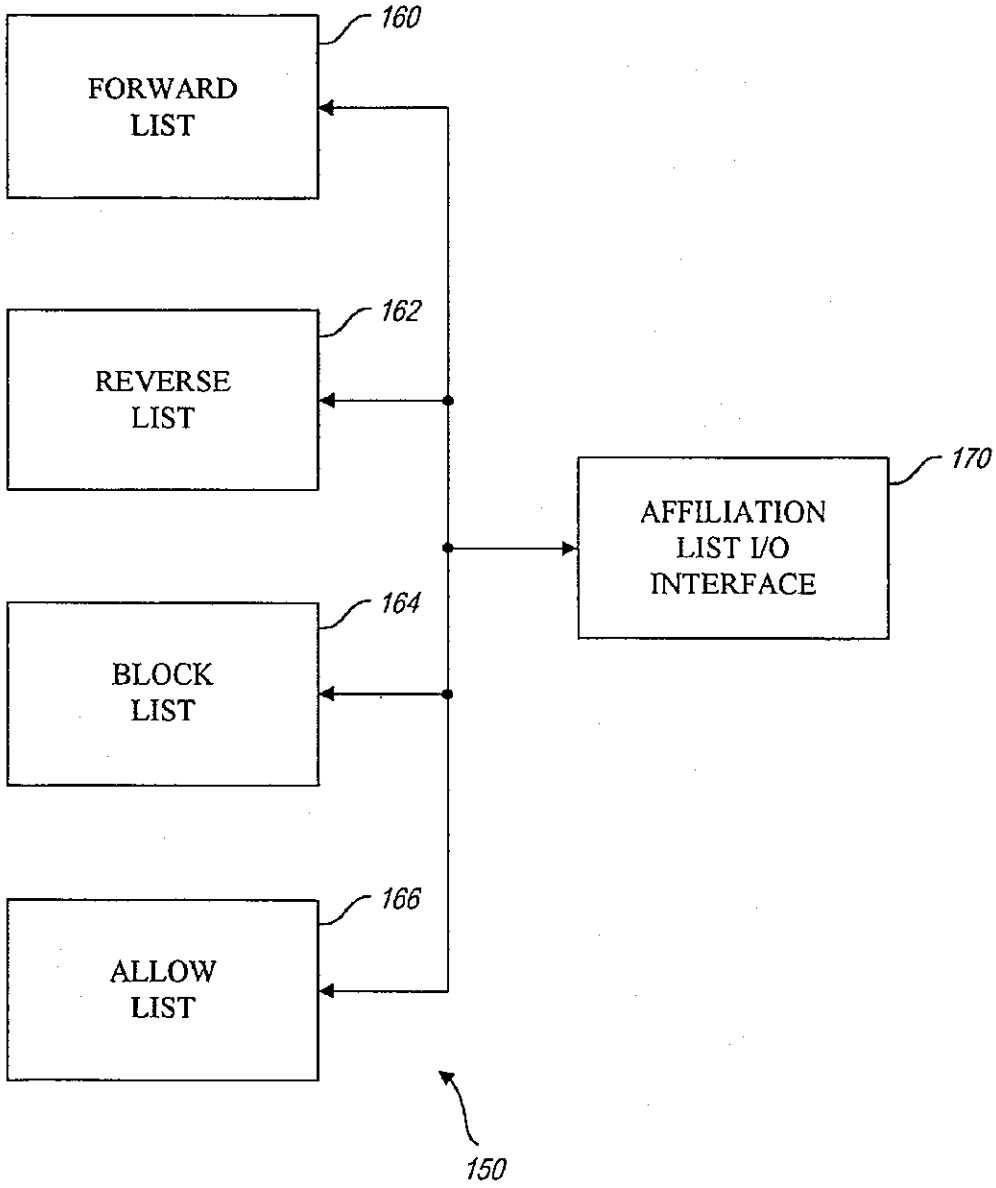
110
ORIGINATING TELEPHONE
100

Fig. 4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REVERSE LIST
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BLOCK LIST
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ALLOW LIST
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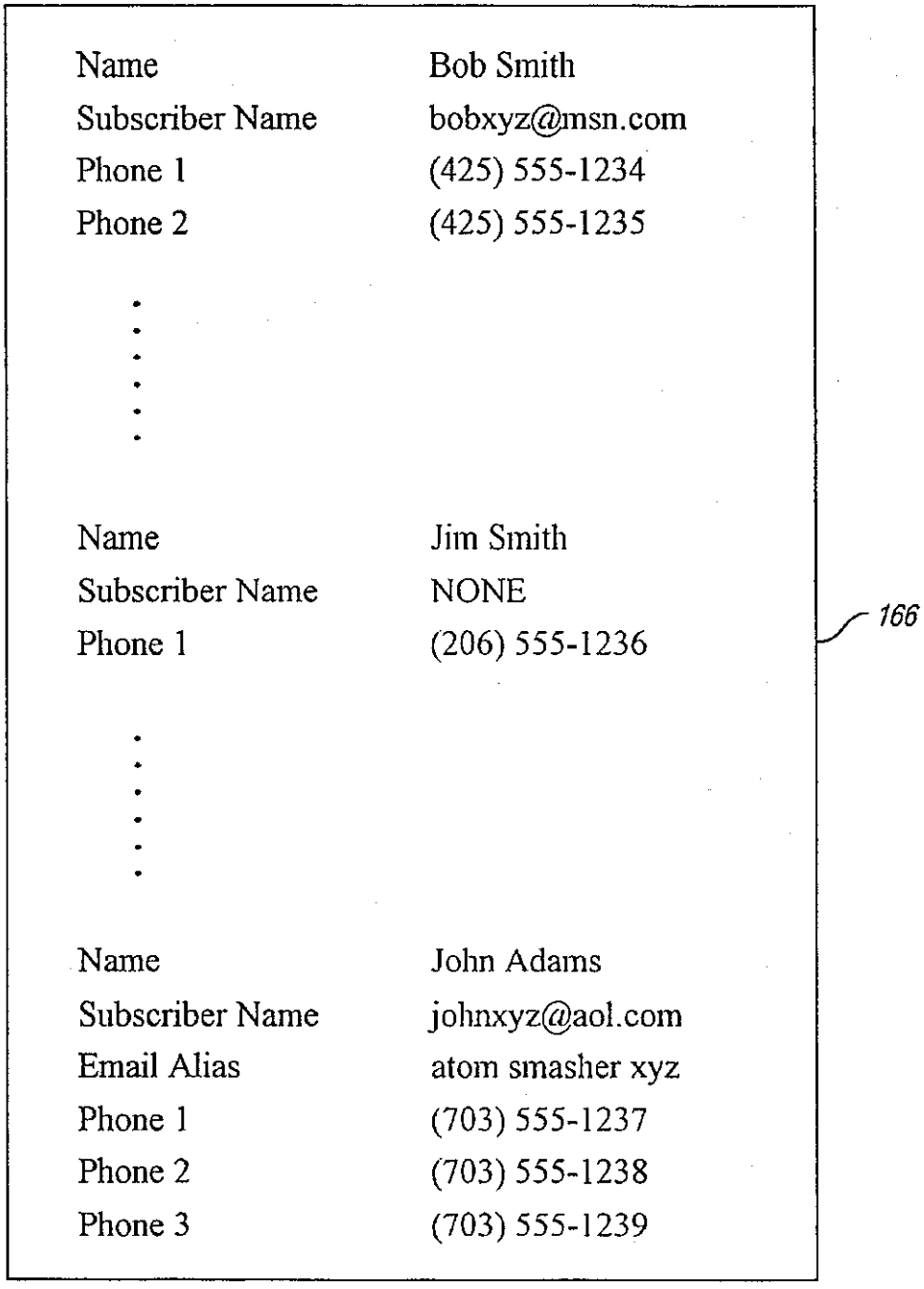
AFFILIATION LIST I/O INTERFACE
150

Fig. 5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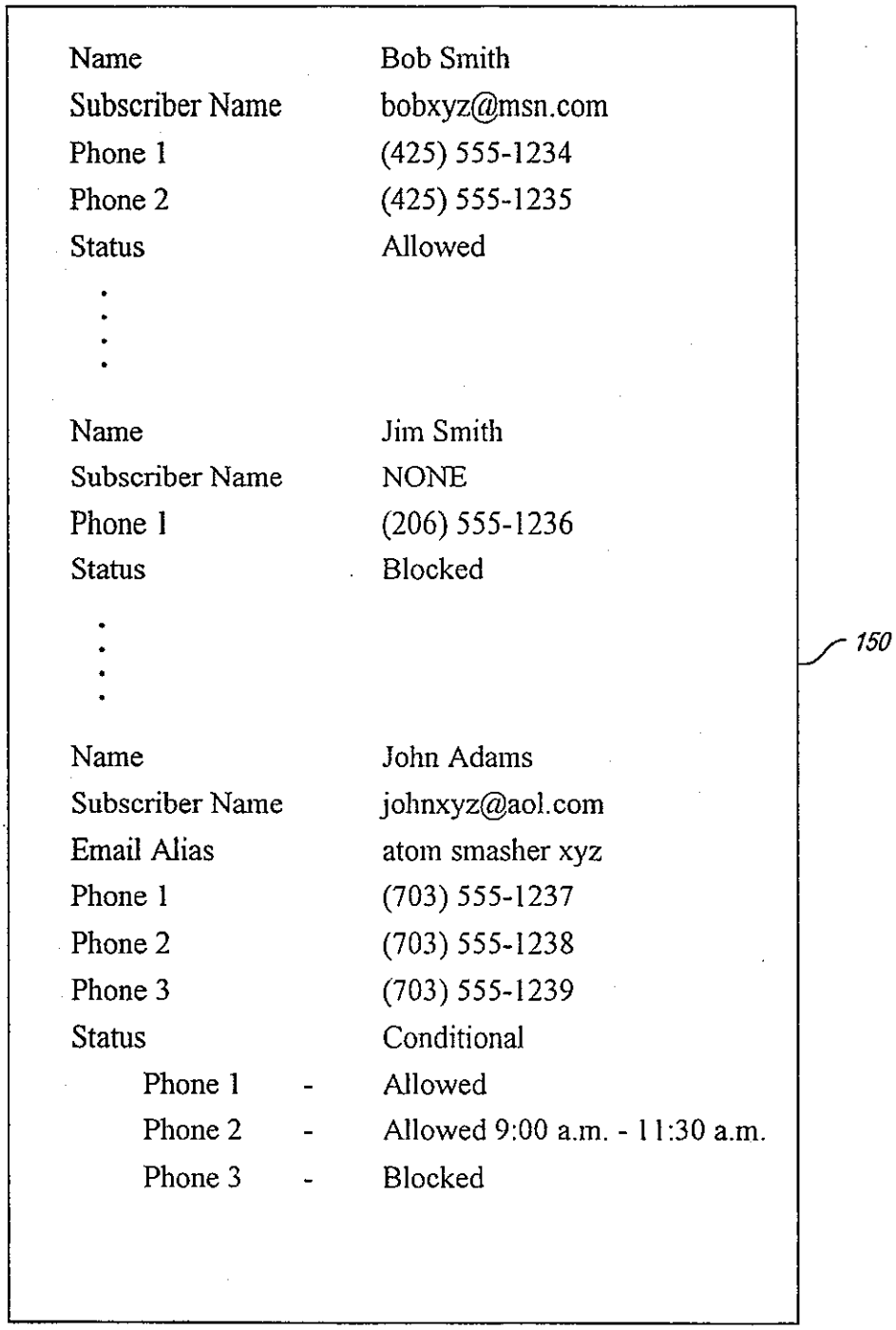
Subscriber Name bobxyz@msn.com
Phone 1 (425) 555-1234
Phone 2 (425) 555-1235
Name Jim Smith
Subscriber Name NONE
Phone 1 (206) 555-1236
166
Name John Adams
Subscriber Name johnxyz@aol.com
Email Alias atom smasher xyz
Phone 1 (703) 555-1237
Phone 2 (703) 555-1238
Phone 3 (703) 555-1239

Fig. 6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Subscriber Name bobxyz@msn.com
Phone 1 (425) 555-1234
Phone 2 (425) 555-1235
Status Allowed
Name Jim Smith
Subscriber Name NONE
Phone 1 (206) 555-1236
Status Blocked
Name John Adams
Subscriber Name johnxyz@aol.com
Email Alias atom smasher xyz
Phone 1 (703) 555-1237
Phone 2 (703) 555-1238
Phone 3 (703) 555-1239
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Phone 2 - Allowed 9:00 a.m. - 11:30 a.m.
Phone 3 - Blocked
150

Fig. 7

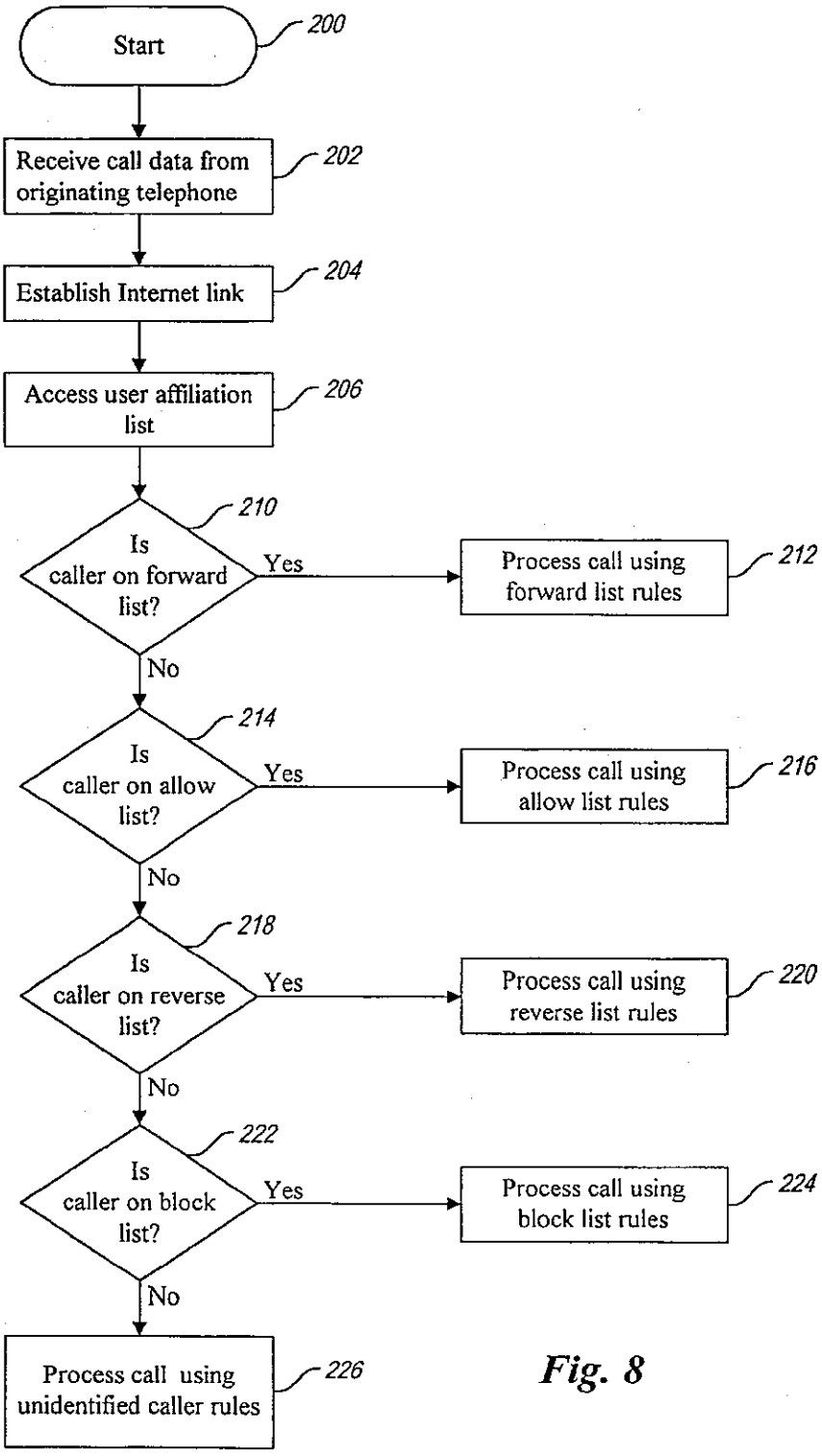
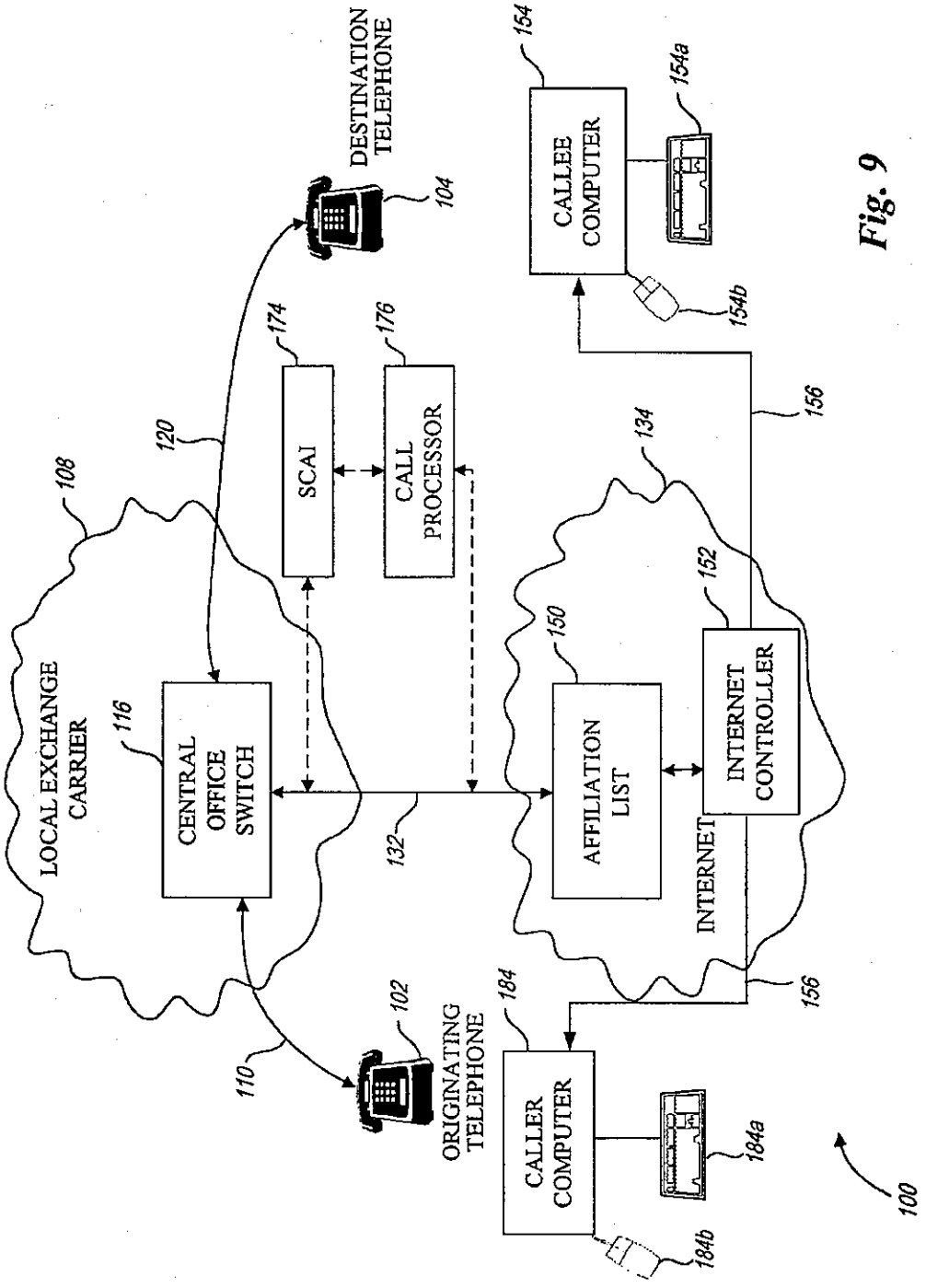

Start
200
Receive call data from originating telephone
202
Establish Internet link
204
Access user affiliation list
206
Is caller on forward list?
210
Yes
Process call using forward list rules
212
No
Is caller on allow list?
214
Yes
Process call using allow list rules
216
No
Is caller on reverse list?
218
Yes
Process call using reverse list rules
220
No
Is caller on block list?
222
Yes
Process call using block list rules
224
No
Process call using unidentified caller rules
226

Fig. 8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AFFILIATION LIST
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ORIGINATING TELEPHONE
110
184
CALLER COMPUTER
184a
184b
100

Fig. 9

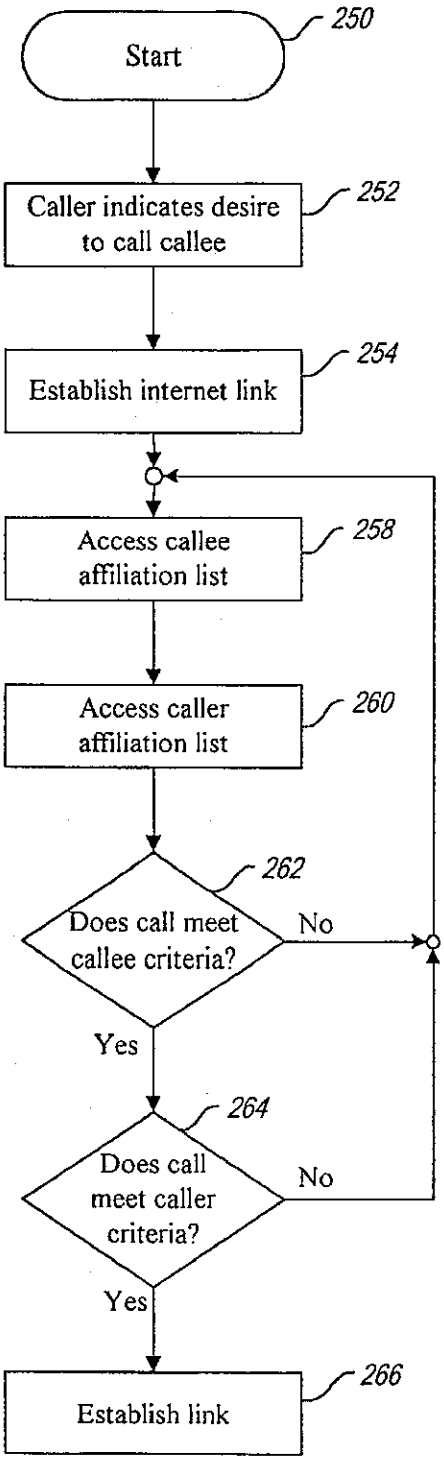
Start
250
Caller indicates desire to call callee
252
Establish internet link
254
Access callee affiliation list
258
Access caller affiliation list
260
Does call meet callee criteria?
262
No
Yes
Does call meet caller criteria?
264
No
Yes
Establish link
266

Fig. 10

SYSTEM AND METHOD FOR COMPUTERIZED STATUS MONITOR AND USE IN A TELEPHONE NETWORK

TECHNICAL FIELD

The present invention is directed generally to telecommunications and, more particularly, to a system and method for establishing a telephone communication link using status reporting information from an independent computer network.

BACKGROUND OF THE INVENTION

Telephone communication systems have increased in both size and complexity. Early telephone systems required a human operator to manually connect an originating telephone with a destination telephone. With the introduction of automatic switching technology, the need for human operators to connect each and every call disappeared. However, even automated switches did not provide the wide range of features available on most telephone systems, such as voicemail, caller identification, call waiting, call forwarding, three-way calling and the like. Most telephone systems today include these features and allow the customer to select one or more features to customize their telephone service. With features such as voicemail, the telephone switching system must recognize when the destination telephone is either busy or remains unanswered. If either of these conditions occur, the calling party is routed to the voicemail service associated with the destination telephone.

Despite these improvements, telephone systems are incapable of determining when a particular recipient (i.e., a callee) may be available to receive a call. The caller has no choice but to place a call to the destination telephone and hope that the callee answers. Alternatively, the caller may leave a voicemail indicating a specific time at which the caller will place yet another call. This is an undesirable activity since it requires multiple calls, thus utilizing telecommunication capabilities in an inefficient manner. In addition, repeated or failed attempts to actually reach the callee are a waste of human resources since the parties must often call back and forth to each other a number of times before actually reaching the desired party. Therefore, it can be appreciated that there is a significant need for a system and method that can establish a telephone communication link when both parties are available to communicate. The present invention provides this and other advantages as will be apparent from the following detailed description and accompanying figures.

SUMMARY OF THE INVENTION

A system to specify user-selectable criteria for call processing is implemented on a telephone system, such as a public switched telephone network (PSTN). The user-specified call processing criteria is stored on a network that is accessible by the user for data entry and/or editing, and is also accessible by the PSTN to determine whether call processing criteria exists for the particular caller. The Internet provides a readily available data structure for storage of the user-selectable call processing criteria. The user can establish a database stored on the Internet in association with the user's telephone number and indicating the user-selectable call processing criteria for one or more potential callers.

The caller may be identified by caller identification data, such as automatic number identification (ANI). Based on the destination telephone number and the caller identification data, the PSTN accesses the Internet and examines an affiliation list corresponding to the destination telephone number. If the caller identification data is present in the affiliation list, the call may be processed in accordance with the user-specified criteria for that particular caller.

Both the caller and callee can specify user-selectable call processing criteria. The potential callee can specify call processing criteria for all incoming calls, such as providing a list of individuals from whom the person will accept calls, a list of individuals from whom the person will not accept calls, or conditional criteria, such as accepting or blocking calls during certain times of day or during certain periods of activity, such as when the user may be otherwise occupied and unwilling to accept an incoming call. In addition, the potential callee's computer activity may be monitored and the status of the computer as idle or active may be reported to the computer network. The caller indicates a desire to establish a communication link with the callee. The computer network accesses the caller's call processing criteria and the callee's call processing criteria. The call processing criteria for both the caller and callee are analyzed and when all conditions are met, a telephone communication link is established between an originating telephone associated with the caller and a destination telephone associated with the callee.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a computer system that includes components to implement the system of the present invention.

FIG. **2** is a functional block diagram outlining the operation of the present invention.

FIG. **3** is a functional block diagram of an alternate telecommunications configuration implementing the present invention.

FIG. **4** is a functional block diagram of another alternative telecommunications configuration implementing the present invention.

FIG. **5** is a functional block diagram providing details of the affiliation list of the system of FIG. **2**.

FIG. **6** illustrates sample data provided in the list of FIG. **5**.

FIG. **7** illustrates additional sample data provided in the list of FIG. **3**.

FIG. **8** is a flowchart illustrating the operation of the system of FIG. **2**.

FIG. **9** is a functional block diagram illustrating the system of the present invention to process a call in accordance with both a caller and callee call processing criteria.

FIG. **10** is a flowchart illustrating the operation of the system of FIG. **9**.

DETAILED DESCRIPTION OF THE INVENTION

Existing telephone technology does not provide the telephone subscriber with a technique for controlling access to the user's telephone. Features such as caller ID identify the caller, but do not control access to the user's telephone. Thus, the conventional telephone system forwards the user to extreme options. The user may answer all incoming calls or may choose not to answer any incoming calls. However, the present invention provides selective options in between these two extremes. The present invention combines telephone technology with Internet technology to allow the user

to "filter" incoming calls based on user-selected criteria. In particular, the user may establish a series of lists, stored on the Internet in association with the user's telephone, to filter incoming calls and thereby control access to the user's telephone. In addition, it is possible to monitor the activity or status of both a caller and a callee and establish a communication link between the caller's telephone and the callee's telephone when status data indicates that both are available for a telephone call.

FIG. 1 and the following discussion are intended to provide a brief, general description of a suitable computing environment in which the invention may be implemented. Although not required, the invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a personal computer. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention may be practiced with other computer system configurations, including hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, and the like. The invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

With reference to FIG. 1, an exemplary system for implementing the invention includes a general purpose computing device in the form of a conventional personal computer 20, including a processing unit 21, a system memory 22, and a system bus 23 that couples various system components including the system memory to the processing unit 21. The system bus 23 may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory 22 includes read only memory (ROM) 24 and random access memory (RAM) 25. A basic input/output system 26 (BIOS), containing the basic routines that helps to transfer information between elements within the personal computer 20, such as during start-up, may be stored in ROM 24.

The personal computer 20 further includes input/output devices 27, such as a hard disk drive 28 for reading from and writing to a hard disk, not shown, a magnetic disk drive 29 for reading from or writing to a removable magnetic disk 30, and an optical disk drive 31 for reading from or writing to a removable optical disk 32 such as a CD ROM or other optical media. The hard disk drive 28, magnetic disk drive 29, and optical disk drive 31 are connected to the system bus 23 by a hard disk drive interface 33, a magnetic disk drive interface 34, and an optical drive interface 35, respectively. The drives and their associated computer-readable media provide nonvolatile storage of computer readable instructions, data structures, program modules and other data for the personal computer 20. Although the exemplary environment described herein employs a hard disk, a removable magnetic disk 30 and a removable optical disk 32, it should be appreciated by those skilled in the art that other types of computer readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, random access memories (RAMs), read only memories (ROM), and the like, may also be used in the exemplary operating environment. Other I/O devices 27, such as a display 36, keyboard 37, mouse 38, and the like may be included in the personal computer 20 and function in a known manner. For the sake of brevity, other components, such as a joystick, sound board and speakers are not illustrated in FIG. 1.

The personal computer 20 may also include a network interface 39 to permit operation in a networked environment using logical connections to one or more remote computers, such as a remote computer 40. The remote computer 40 may be another personal computer, a server, a router, a network PC, a peer device or other common network node, and typically includes many or all of the elements described above relative to the personal computer 20, although only a memory storage device 42 has been illustrated in FIG. 1. The logical connections depicted in FIG. 1 include a local area network (LAN) 43 and a wide area network (WAN) 44. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets and the Internet.

When used in a LAN networking environment, the personal computer 20 is connected to the LAN 43 through the network interface 39. When used in a WAN networking environment, the personal computer 20 typically includes a modem 45 or other means for establishing communications over the wide area network 44, such as the Internet. The modem 45, which may be internal or external, permits communication with remote computers 46-50. In a networked environment, program modules depicted relative to the personal computer 20, or portions thereof, may be stored in the remote memory storage device 42 via the LAN 51 or stored in a remote memory storage device 52 via the WAN 44. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

The present invention is embodied in a system 100 illustrated in the functional diagram of FIG. 2. In a typical telephone communication, an originating telephone 102 is operated by the caller to place a call to a destination telephone 104. The originating telephone generates signals that are detected by a central office switch 106 operated by a local exchange carrier (LEC) 108. The LEC 108 is the telephone service provider for the calling party. The originating telephone 102 is coupled to the central office switch 106 via a communication link 110. As those skilled in the art can appreciate, the communication link 110 may be a hard-wired connection, such as a fiber optic, copper wire, or the like.

Alternatively, the communication link 110 may be a wireless communication link if the originating phone 102 is a cellular telephone or some other form of wireless telephone.

Similarly, the destination telephone 104 is coupled to a central office switch 116 operated by a local exchange carrier (LEC) 118. The destination telephone 104 is coupled to the central office switch 116 via a communication link 120. The communication link 120 may be a hard-wired communication link or a wireless communication link, as described above with respect to the communication link 110. The present invention is not limited by the specific form of communication link or central office switch.

The LEC 108 establishes a communication link with the LEC 118. As illustrated in FIG. 2, the communication link between the LEC 108 and the LEC 118 is through a long distance carrier (LDC) 124. The LEC 108 establishes a communication link 126 with the LDC 124 which, in turn, establishes a communication link 128 with the LEC 118. If

the telephone call from the originating telephone **102** to the destination telephone **104** is not a long distance call, the LDC **124** is not required. In this case, the communication link **126** may couple the LEC **108** directly to the LEC **118**. The use of the system **100** with other telephone configurations are illustrated in other figures.

To place a telephone call, the caller activates the originating telephone **102** to dial in the telephone number corresponding to the destination telephone number **104**, thereby establishing the communication link **110** with the central office switch **106**. In turn, the central office switch **106** establishes the communication link **126** (via the LDC **124**, if necessary), thus establishing a communication link with the central office switch **116**. In a conventional telephone system, the central office switch **116** establishes the communication link **120** to the destination telephone **104** causing the destination telephone to ring. If the callee picks up the destination telephone, a complete communication link between the originating telephone **102** and the destination telephone **104** has been established. This is sometimes referred to as "terminating" the telephone call. The specific telecommunications protocol used to establish a telephone communication link between the originating telephone **102** and the destination telephone **104** is well known in the art and need not be described herein. The preceding description of techniques used to establish the telephone communication link are provided only as a basis for describing the additional activities performed by the system **100**.

With the system **100**, the central office switch **116** does not initially establish the telephone communication link **120** with the destination telephone **104** to cause the telephone to ring. Instead, the central office switch **116** establishes a communication link **132** with a computer network **134**, such as the Internet. As those skilled in the art can appreciate, the Internet is a vast multi-computer network coupled together by data links having various communication speeds. Although the Internet **134** may use a variety of different communication protocols, a well-known communication protocol used by the Internet is a Transmission Control Protocol/Internet Protocol (TCP/IP). The transmission of data on the Internet **134** using the TCP/IP is known to those skilled in the art and need not be described in greater detail herein.

The central office switch **116** utilizes conventional telephone communication protocols, which may be different from the TCP/IP communication protocols used by the Internet **134**. The system **100** includes a communication interface **136** to translate data between the two communication protocols. The communication interface **136** includes a telephone interface portion **138** and an Internet interface portion **140**. The telephone interface portion **138** is coupled to the central office switch **116** via the communication link **132** such that communications occurring on the communication link **132** utilize the telephone communication protocol. The Internet interface portion **140** communicates via the Internet using conventional communication protocols, such as TCP/IP.

The communication interface **136** may be implemented on a computing platform that functions as a server. The conventional components of the computing platform, such as a CPU, memory, and the like are known to those skilled in the art and need not be described in greater detail herein. The telephone interface portion **138** may comprise an Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) to communicate with the central office switch **116**. The ISDN PRI, which may be implemented on a plug-in computer card, provides information to the telephone interface portion **138**, such as automatic number identification (ANI), dialed number identification service (DNIS), and the like. As is known, ANI provides the telephone number of the caller's telephone (e.g., the originating telephone **102**) while the DNIS allows the number the caller dialed (e.g., the destination telephone **104**) to be forwarded to a computer system. These data may be considered "keys" which may be used by the system **100** to identify the caller and the callee. Thus, the central office switch **116** provides information which may be used to access the affiliation list **150** for the destination telephone **104**.

The Internet interface portion **140** may be conveniently implemented with a computer network card mounted in the same computing platform that includes the ISDN PRI card. However, it is not necessary for satisfactory operation of the system **100** that the interface cards be co-located in the same computing platform. It is only required that the telephone interface portion **138** communicate with the Internet interface portion **140**. The Internet interface portion **140** receives the incoming data (e.g., the ANI, DNIS, and the like) and generates Internet compatible commands. The specific form of the Internet commands using, by way of example, TCP/IP, are within the scope of knowledge of one skilled in the art and need not be described herein. As will be described below, data provided by the central office switch **116** will be used to access data on the Internet and use that data to determine the manner in which a telephone call will be processed.

The Internet **134** stores an affiliation list **150**, which may be established by the user of the destination telephone **104**. Data stored within the affiliation list **150** is accessed by the central office switch **116** to determine the manner in which the call from the originating telephone **102** will be processed. Details of the affiliation list **150** are provided below. The Internet **134** also includes an Internet controller **152** which communicates with a callee computer **154** via a network link **156**. The communication between the callee computer **154** and the Internet **134** is a conventional communication link used by millions of computers throughout the world. For example, the callee computer **154** may be a personal computer (PC) containing a communication interface, such as a modem (not shown). The network link **156** may be a simple telephone communication link using the modem to communicate with the Internet **134**. The Internet controller **152** functions in a conventional manner to communicate with the callee computer **154** via the network link **156**. Although the communication link **132** and the network link **156** are both communication links to the Internet, the network link **156** is a conventional computer connection established over a telephone line, a network connection, such as an Ethernet link, or the like. This conventional network link **156** is significantly different from the communication link **132** between the central office switch **116** and the Internet **134**. The central office switch **116** establishes the communication link **132** to access data on the Internet and uses that accessed data to determine how to process an incoming call for the destination telephone **104**. The network link **156** is a computer-to-computer connection that may simply use a telephone as the physical layer to establish the network link.

In the system **100**, the central office switch **116** receives an incoming call from the originating telephone **102** via the central office switch **106** and, optionally, the LDC **124**. Rather than immediately establishing the communication link **120** and generating a ring signal at the destination telephone **104**, the central office switch **116** establishes the

communication link **132** and communicates with the Internet **134** via the communication interface **136**. The purpose of such communication is to access the affiliation list **150** and thereby determine the manner in which the user of the destination telephone **104** wishes calls to be processed.

FIG. **3** illustrates the system **100** for a telephone system configuration in which the originating telephone **102** and the destination telephone **104** are both serviced by the same local exchange carrier **108**. The originating telephone **102** establishes the communication link **110** with the central office switch **106** in the manner described above. The central office switch **106** establishes the communication link **126** directly with the central office switch **116** without the need for the LDC **124** (see FIG. **2**). The central office switch **116** operates in the manner described above. That is, the central office switch **116** does not immediately establish the communication link **120**, but does establish the communication link **132** with the Internet **134**. For the sake of simplicity, FIG. **3** does not illustrate the communication interface **136**. However, those skilled in the art will appreciate that the central office switch **116** accesses the affiliation list **150** via the communication interface **136** (see FIG. **2**).

For the sake of simplicity, FIG. **3** also does not show the Internet controller **152** and the callee computer **154**. However, those skilled in the art can appreciate that those portions of the system may also be present in the embodiment illustrated in FIG. **3**. However, it should be noted that the callee computer **154** and the Internet controller **152** need only be used to edit the affiliation list **150**. The call processing by the central office switch **116** does not depend on the presence of the Internet controller **152** or the callee computer **154**. That is, the central office switch **116** accesses the affiliation list **150** via the communication interface **136** regardless of the presence of the callee computer **154**.

In yet another telephone system configuration, illustrated in FIG. **4**, the originating telephone **102** and the destination telephone **104** are not only serviced by the same local exchange carrier **108**, but are connected to the same central office switch **116**. However, the fundamental operation of the system **100** remains identical to that described above with respect to accessing the affiliation list **150**. That is, the originating telephone **102** establishes the communication link **110** with the central office switch **116**. However, the central office switch **106** need not establish the communication link **126** with any other central office switch since the destination telephone **104** is also connected to that same central office switch.

In this telephone system configuration, the central office switch **116** accesses the affiliation list **150** on the Internet **134** via the communication link **132** (see FIG. **2**) in the manner described above. For the sake of simplicity, FIG. **4** does not illustrate the communication interface **136**. However, those skilled in the art will recognize that the communication interface **136** operates to convert communication signals between telephone protocol used by the central office switch **106** and the Internet communication protocol used by the Internet **134**. In addition, FIG. **4** also does not illustrate the Internet controller **152** and the callee computer **154**. As noted above with respect to FIG. **3**, the Internet controller **152** and callee computer **154** are not necessary for proper operation of the system **100**. The callee computer **154** is typically used in the system **100** to edit the affiliation list **150**.

The affiliation list **150** is illustrated in greater detail in the functional block diagram of FIG. **5**. The affiliation list comprises a series of sublists, illustrated in FIG. **3** as a forward list **160**, a reverse list **162**, a block list **164**, and an allow list **166**. The forward list **160** contains a list of Internet subscribers whose Internet activity a user wishes to monitor. This list is sometimes referred to as a "buddy" list. When the user operates the callee computer **154** on the Internet **134**, the Internet controller **152** accesses the forward list **160** via an affiliation list input/output (I/O) interface **170** to determine which Internet subscribers contained within the forward list are currently active on the Internet **134**. In conventional Internet operation, the Internet controller **152** sends a message to the callee computer **154** indicating which Internet subscribers on the forward list **160** are currently active on the Internet **134**.

The forward list **160** is a list of Internet subscribers whose activity is reported to the user. Other Internet subscribers may have their own forward list (not shown) and may monitor the Internet activity of the user. When the user accesses the Internet **134** with the callee computer **154**, that activity can be monitored by others. With the system **100**, it is possible to determine who is monitoring the user's Internet activity. The reverse list **162** contains a list of Internet subscribers who have placed the user in their forward list. That is, the reverse list **162** contains a list of Internet subscribers who have placed the user in their buddy list. With the reverse list **162**, the user can determine who is monitoring his Internet activity.

The block list **164** contains a list of Internet subscribers that the user does not want to monitor his Internet activity. That is, the user's Internet activity will not be provided to any Internet subscriber contained in the block list **164**. Thus, even if a particular Internet subscriber has placed the user on their forward list, the presence of that particular Internet subscriber's name on the block list **164** will prevent the user's Internet activity from being reported to the particular Internet subscriber. The use of the block list **164** provides certain security assurances to the user that their Internet activity is not being monitored by any undesirable Internet subscribers.

The allow list **166** contains a list of Internet subscribers for whom the user may wish to communicate with but whose Internet activity the user does not wish to monitor.

The system **100** combines the capabilities of the affiliation list **150** with telephone switching technology to filter incoming calls to the destination telephone **104**. For example, the user may specify that only calls from Internet subscribers contained in the forward list **154** may contact the user via the destination telephone **104**. Alternatively, the user may specify that a calling party whose name is contained in the forward list **160** or the allow list **166** may place a call to the destination telephone **104**. As will be discussed in greater detail below, the system **100** allows the user to create general conditional processing, such as blocking calls or allowing calls. However, the user can also create specific conditional processing for individual callers or based on the user's current status or preferences.

The central office switch **116** accesses the affiliation list **150** via the communication link **132** and determines whether the calling party is in a list (e.g., the forward list **160**) that the user wishes to communicate with. If the calling party is contained within an "approved" list, the central office switch **116** establishes the communication link **120** and sends a ring signal to the destination telephone **104**. Thus, the user can pick up the telephone with the knowledge that the calling party is an individual with whom the user wishes to communicate.

Conversely, if the calling party is not contained within an approved list, such as the forward list **160** or the allow list

166, the central office switch 116 will not establish the communication link 120 with the destination telephone 104. Thus, the user will not be bothered by undesirable phone calls. In one embodiment, the central switch office simply will not establish the communication link 120 and the calling party will recognize that the call did not go through. Alternatively, the central office switch 116 may generate a signal indicating that the destination telephone 104 is busy. In this alternative embodiment, the calling party will receive a busy signal on the originating telephone 102. Thus, the user has the ability to filter incoming calls by creating a list of those individuals with whom the user wishes to communicate.

It should be noted that the affiliation list 150 may be dynamically altered by the user to add or delete individuals, change individuals from one list to another, or to change the call processing options for a particular list depending on the user's preferences. For example, the user may want to accept all calls from any source at certain times of the day. Under these circumstances, the user can edit the allow list 166 to accept calls from any calling party. Alternatively, the user may still maintain the block list 164 such that calls will not be processed from certain specified parties even if the user is willing to accept calls from any other source. Under other circumstances, the user may not wish to communicate with any individuals. In this instance, the user may indicate that all calling parties are on the block list 164. Thus, the central office switch 116 will access the Internet 134 in real-time and review data in the affiliation list 150 to thereby process incoming calls for the user in accordance with the rules present in the affiliation list.

The discussion above provides examples of the central office switch 116 processing calls from a calling party in accordance with their presence or absence of certain lists in the affiliation list 150. For example, a call from a party on the forward list 160 will be connected to the destination telephone 104 (see FIG. 2) while a call from a party on the block list 164 will not be put through to the destination telephone. However, the system 100 also allows the selection of call processing options on an individual basis rather than simply on the presence or absence in a particular list. For example, the user can edit the allow list 166 to specify that certain individuals are "allowed" while other individuals may be allowed, conditionally allowed, or blocked all together. If the individual calling party has an associated status indicating that they are allowed, the central office switch 116 will process the incoming call and connect it to the destination telephone 104. If the individual calling party has an associated blocked status, the central office switch 116 will not process the call and will not connect it to the destination telephone 104.

Furthermore, the user may attach conditional status to individual callers or to calling lists. Conditional status may be based on factors, such as the time of day, current availability of the user, work status, or the like. For example, the user may accept calls from certain work parties during specified periods of the day (e.g., 9:00 a.m.–11:00 a.m.), block calls from selected calling parties during other periods of time (e.g., 12:00–1:00 p.m.), or allow calls during a business meeting only from certain calling parties (e.g., the boss). These conditional status criteria may be applied to individuals or to one or more lists in the affiliation list 150.

FIG. 6 illustrates sample data entries in the allow list 166. The allow list 166 may include data, such as a name, Internet subscriber name, and one or more phone numbers associated with the individual data entry. It should be noted that the calling party need not have an Internet subscriber name for proper operation of the system 100. That is, the central office switch 116 accesses the allow list 166 utilizing the calling party number and need not rely on any email addresses or other Internet subscriber identification for proper operation. The allow list 166 may also include an email alias in addition to or in place of the Internet subscriber name. Some Internet subscribers prefer to "chat" with other subscribers utilizing an alias rather than their actual Internet subscriber name. The data of FIG. 6 illustrates one possible embodiment for the allow list 166. However, those skilled in the art can appreciate that the allow list 166 may typically be a part of a large database (not shown). Database operation is well known in the art, and need not be described in greater detail herein. The database or other form of the forward list 160 may be satisfactorily implemented using any known data structure for storage of data. For example, the various lists (e.g., the allow list 166, the reverse list 162, the block list 164 and the allow list 166) may all be integrated within a single database structure. The present invention is not limited by the specific structure of the affiliation list 150 nor by the form or format of data contained therein.

Rather than incoming call filtering on the basis of presence in a particular list, such as the allow list 166, as illustrated in FIG. 6, the affiliation list 150 may contain status data on an individual basis. In this event, the central office switch 116 (see FIG. 2) processes the incoming call in accordance with the designated status for that individual. In the example illustrated in FIG. 7, the affiliation list 150 contains one individual with an "allowed" status, one individual with a "blocked" status, and one individual with a "conditional" status based on user-selected criteria. In the example of FIG. 7, the user-selected criteria may be based on the particular phone from which the call is originating as well as the time of day in which the call is originated. For example, the user may wish to allow all calls from a particular number, such as an caller's work number. However, calls from another number, such as the caller's home phone, may be blocked. Other calls, such as from a caller's cellular telephone, may be allowed only at certain times of day. FIG. 7 is intended to illustrate some of the call processing options that are available to the user. As can be appreciated, a variety of different conditional status criteria may be applied to one or more potential calling parties. However, a common feature of the system 100 is that the telecommunication system. (e.g., the central office switch 116) determines calling pat status on the basis of information stored on the Internet and processes the incoming call in accordance with the user-specified criteria. Moreover, the system 100 operates in real-time to process the incoming call in accordance with the user-specified criteria.

The Internet 134 may be conveniently used as a storage area for the caller specified criteria. The advantage of such data storage on the Internet is that the data is widely accessible to the user. This provides a convenient mechanism for entering new caller data or editing existing caller data. The user can access the affiliation list 150 with the callee computer 154 via the network link 156. In contrast, the central office switch 116 may access the affiliation list 150 via the communication link 132, which may typically be a high-speed communication link. In addition, FIGS. 2, 4, and 5 illustrate the central office switch 116 as the telecommunication component that accesses the Internet 134. It is convenient for operational efficiency to have the central office switch (e.g., the central office switch 116) to which the destination telephone 104 is connected perform such Internet access. It is at this stage of the telephone call processing that the telecommunication system may most conveniently

determine the user-specified caller status. However, those skilled in the art will recognize that the status check may be performed by other portions of the telecommunication system, such as the central office switch **106**, the LDC **124**, or the like. Thus, the present invention is not limited by the particular telecommunication component that establishes the communication link with a network which the user-specified caller status data is stored.

In addition, the system **100** can be readily implemented as an "add-on" component of the telecommunication system and need not be integrated with the central office switch **116**. For example, the conventional central office switch provides the ability to divert calls based on certain call conditions, such as "Call Forward No Answer," which may be used to divert an incoming call to voicemail or "Call Forward Busy," which may also divert the incoming call to voicemail. To implement the system **100** with an add-on processor, the system may optionally include a Switch to Computer Applications Interface (SCAI) **174** and a call processor **176**. The dashed lines of FIG. **4** are intended to illustrate an alternative configuration of the system **100**. This alternative configuration can also be implemented with other telephone system configurations, such as illustrated in FIGS. **2** and **3**. The SCAI **174** is a telecommunication protocol that allows switches to communicate with external computers. Data, such as caller and callee telephone numbers, and status information, such as Call Forward Busy, are provided to the SCAM **174** by the central office switch **116**.

The call processor **176** performs the functions described above to process the call in accordance with the user-specified criteria. That is, the call processor **176** receives caller and callee data from the SCAI **174** and accesses the affiliation list **150** via the communication interface **136** (see FIG. **2**). The call processor **176** uses user-specified call processing criteria to generate instructions for the central office switch **116**. The instructions are provided to the central office switch **116** via the SCAI **174**. Those skilled in the art will appreciate that the SCAI **174** is but one example of the Open Application Interface (OAI) that can be used with the central office switch **116**.

As noted above, the system **100** can process a call intended for the destination telephone **104**, block a call, or generate a busy signal at the originating telephone **102**. However, the system **100** also operates with voicemail and permits a number of different customized outgoing messages. FIG. **4** illustrates a voicemail system **180** having a storage area containing one or more outgoing messages **182**. For example, the voicemail system **180** can play an outgoing message **182** informing the caller that "the party you are calling only accepts calls from designated callers. Please leave a message." If calls are blocked only at certain times, the outgoing message **182** can say "the party you are calling does not accept calls between 11:30 a.m. and 1:00 p.m. Please leave a message or call back after 1:00 p.m." The outgoing message can also reflect callee availability by playing a message such as "The party you are calling is in a meeting. Please leave a message or call back in X minutes" where X reflects the amount of time before the meeting is expected to end. That information can be manually provided to the affiliation list **150** by the user or automatically derived from a computerized scheduling program on, by way of example, the callee computer **154** (see FIG. **2**).

Computerized scheduling programs, such as Microsoft® D Schedule Plus, can be used on the callee computer **154** (see FIG. **2**). It is known that such scheduling programs can be accessed via a computer network or downloaded to a hand-held computing device to track appointments. The system **100** can access such computerized scheduling programs and download appointments and scheduled meetings into the affiliation list **150**. The outgoing messages **182** can be automatically selected on the basis of the user's computerized schedule. Thus, the system **100** permits the user to schedule his day (e.g., meetings, lunch time, in office/available for calls, in office/unavailable for calls, etc.) on a computerized scheduling program and to process calls in accordance with the computerized schedule and even select outgoing messages automatically based on the user's schedule.

The operation of the system **100** is illustrated in the flowchart of FIG. **7**. At a start **200**, the calling party has placed a call from the originating telephone **102** (see FIG. **2**) to the destination telephone **104**. In step **202**, the central office switch **116** has received call data from the originating telephone **102**. The received call data includes the destination telephone number of the destination telephone **104** and identification data indicating the originating telephone **102** as the source of the present call. Use of automatic number identification (ANI) is a well-known technique for providing identification data indicating the originating telephone **102** as the source of the present call. While the specific implementation of ANI data, sometimes referred to as caller ID, may not be uniformly implemented throughout the United States, the ANI data is typically delivered between the first and second rings. In the present invention, the central office switch **116** (see FIG. **2**) does not initiate a ring signal to the destination telephone **104** until after determining the status of the calling party based on the ANI. In future implementations, telecommunication companies may transmit other forms of caller identification, such as caller name, Internet address, email alias, or the like. The system **100** operates satisfactorily with any form of caller identification. The only requirement for the system **100** is that some form of caller identification be provided. The call is processed in accordance with the user-specified criteria in the affiliation list **150** for the identified caller.

In step **204**, the central office switch **116** (see FIG. **2**) establishes the communication link **132** with the Internet **134**. Although step **204** illustrates the system **100** as actively establishing the communication link **132** with the Internet **134**, those skilled in the art will recognize that the system **100** can utilize a continuous high-speed data link between the central office switch and the Internet. Thus, it is not necessary to establish a network link for each and every incoming call processed by the central office switch **116**. As previously described, the communication interface **136** translates data between the telephone protocol and the Internet protocol. In step **206**, the system **100** accesses the affiliation list **150** for the user (i.e., the called party). In an exemplary embodiment, the telephone number of the destination telephone **104** or other callee identification is used as an index or pointer to a specific location within the database where the affiliation list **150** for the particular user may be found. Database operation in general, and techniques for locating specific items within a database in particular are known to those skilled in the art and need not be described herein.

In decision **210**, the system **100** determines whether the caller identification data is on the forward list **160** (see FIG. **3**). If the caller identification data is present in the forward list, the result of the decision **210** is YES. In that event, the system **100** proceeds to FIG. **6B** where the call is processed in accordance with the rules associated with the forward list **160**.

If the caller identification data is not present in the forward list **160** (see FIG. **3**), the result of decision **210** is

NO. In that event, the system **100** moves to decision **212** to determine whether the caller identification data is in the allow list **166**. If the caller identification data is present in the allow list **166**, the result of decision **214** is YES. In that event, the system **100** proceeds to decision **216** where the call is processed in accordance with the rules associated with the allow list **166**. If the caller identification data is not present in the allow list **166**, the result of decision **216** is NO.

In decision **218**, the system **100** determines whether the caller identification data is present in the reverse list **162**. If the caller identification data is present in the reverse list **162**, the system **100** proceeds to the step **220** where the call is processed in accordance with the rules associated with the reverse list **162**. If the caller identification data is not present in the reverse list, the result of decision **218** is NO. In that event, the system moves to decision **216** to determine whether the caller is present on the block list **164**. If the caller is present on the block list **164**, the result of decision **222** is YES. In that event, the system proceeds to step **224** where the call is processed in accordance with the rules associated with the block list. If the caller identification data is not present in the block list **164**, the result of decision **222** is NO. This indicates that the caller identification data is not present in any of the user-specified lists in the affiliation list **150**. In that event, the system moves to step **226** where the call may be processed in accordance with user-specified rules of processing anonymous or unidentified calls. The flowchart of FIG. **8** illustrates the operation of the system **100** with multiple lists wherein the call processing rules are designated for each list. In this embodiment, the call is processed on the basis of the presence or absence of the caller identification data in a particular list. However, as previously discussed, the affiliation list **150** (see FIG. **5B**) may include user-specified status criteria for individual callers. In this embodiment, the system **100** processes the call on the basis of the user-specified status criteria associated with the individual caller rather than on the basis of the caller's presence or absence in a specific list. In that event, the system **100** may simply access the user affiliation list (see step **206** in FIG. **7**) and process the call in accordance with the user-specified status criteria for the individual caller. If the caller identification data is not present in the affiliation list **160**, the call may be processed using user-specified call processing criteria for unidentified callers, as shown in step **226**.

Thus, the system **100** allows the user to specify call processing rules for a plurality of different caller lists or for individual callers within a list. The caller lists may be readily edited in accordance with the changing desires of the user. The user may alter the call processing rules in accordance with various times of day, work conditions, or even the personal mood of the user. For example, the user may process all calls during certain times of the day, such as when the user is at work. However, when the user arrives home, subsequent calls may be processed in accordance with a different set of rules, such as accepting no calls during dinner time or after a certain time at night.

These rules may be applied differentially to different ones of the list in the affiliation list **150**. For example, the user may accept calls from any calling party on the forward list **160** (see FIG. **3**) or the allow list **166** during the evening hours. However, after a certain time at night, the caller may accept calls only from calling parties on the forward list **160**. Thus, the system **100** allows great flexibility in the user selection of calling rules and lists. The system **100** allows the user to filter incoming calls in accordance with generalized rules or in accordance with highly specific rules.

In addition to filtering incoming calls to the destination telephone **104**, the system **100** can monitor the status or activity of both the caller and the callee and establish a communication link between the originating telephone **102** and the destination telephone **104** when the status data indicates that both the caller and callee are available for a telephone conversation. The system **100** has been previously described with respect to callee status monitoring and processing of incoming calls in accordance with the user-selected (i.e., the callee-selected) call processing criteria. Similar status monitoring can be performed for the caller. As illustrated in FIG. **9**, the system **100** may include a caller computer **184**, which is coupled to the Internet via the communication link **132**. For the sake of clarity, FIG. **9** illustrates the callee computer **154** and the caller computer **184** as connected to the Internet **134** through a single Internet controller **152**. However, those skilled in the art will appreciate that the Internet **134**, or any computer network, includes many network controllers that function as a gateway to the network. Thus, the system **100** typically includes a large number of Internet controllers **152**.

In addition, for the sake of clarity, Figure illustrates only a single affiliation list **150**. However, those skilled in the art will appreciate that separate affiliation lists exist for the originating telephone **102** and the destination telephone **104**. The central office switch **116** (or the call processor **176**) access the appropriate affiliation list via the network connection **132** and apply the appropriate call processing rules for each telephone.

FIG. **9** also illustrates a keyboard **154***a* and mouse **154***b* coupled to the callee computer **154** for use in a conventional fashion. Similarly, the caller computer **184** includes a keyboard **184***a* and a mouse **184***b*. The computer operating system, such as the Windows® operating system, is capable of monitoring user activity on the computer. For example, the operating system on the callee computer **154** can detect user activity on the keyboard **154***a* or the mouse **154***b*. By monitoring this activity, the operating system can determine the user's status and activate certain software programs, such as a screen saver, when no user activity has been detected for a certain period of time. Under these circumstances, the operating system may determine that the callee computer **154** has entered an "idle" state. Similarly, operating system on the caller computer **184** may perform similar functions to determine user activity on the caller computer. Using the principles of the present invention, the callee computer **154** and the caller computer **184** may report the current status to the affiliation list **150** for each respective computer.

The system **100** can monitor computer activity and generate signals to both the originating telephone **102** and the destination telephone **104** when the callee computer **154** and the caller computer **184** are not in the idle state. The fact that both computers' are not in the idle state indicates that the users of each respective computer may be available for a telephone conversation. In addition, the system **100** can apply call processing rules that may also govern operation of the telephone portion of the system **100**. For example, the callee computer **154** may be in an "active" state (as opposed to the idle state) but the user has indicated that he should not be disturbed at the present time. Thus, the central office switch **116** or the call processor **176** accesses the affiliation list **150** for the destination telephone **104** to determine the callee-selected call processing criteria. In addition, the central office switch **116** or the call processor **176** can access the affiliation list **150** for the caller and apply any caller-selected call processing rules. For example, the caller computer **184**

may be in the active state, but the caller status in the affiliation list **150** may indicate that the caller is in a meeting and is, therefore, unavailable for a telephone call with the callee. In this manner, the system **100** can monitor computer activity and determine when the caller and callee may both be available for a telephone call and further applies call processing criteria for both the caller and callee. The call processing criteria for the caller and callee as well as the current status of the callee computer **154** and the caller computer **184** are stored within the respective affiliation lists **150** on the Internet **134**. This data may be accessed by the central office switch **116** or the call processor **176** via the network connection **132** in the manner previously described.

In operation, the system allows a caller to indicate a desire to establish a telephone communication link with a specified callee. The caller can use the originating telephone **102** or the caller computer **184** to initiate the call processing by the system **100**. The system **100** monitors the caller and callee activities and call processing rules and, when appropriate for both parties, establishes a telephone communication link by sending signals from the central office switch **116** to the originating telephone to generate a ring signal. The central office switch **116** also generates appropriate signals to generate ring signal at the destination telephone **104**.

As can be appreciated, the originating telephone **102** communicates with the central office switch **116** using the communication link **110** while the caller computer **184** communicates with the Internet **134** using the communication link **132**. The communication link **132** may be a second telephone line, a network connection, such as an Ethernet connection, or the like. If the user has two telephone lines, the telephone number of the telephone (e.g., the destination telephone **104**) can be different from the telephone number associated with the computer (e.g., the callee computer **154**). However, the system **100** must be aware of an association between the telephone and the computer. This is particularly important if the status of the computer (i.e., idle or active) is used as one of the call processing criteria. The system **100** can monitor the activity of a computer (e.g., the callee computer **154**) in order to establish a telephone communication link with an associated telephone (e.g., the destination telephone **104**). It is of no value to monitor a user's computer status at one location and call a completely unrelated telephone at a different location. For example, it is of no value to monitor the callee's computer at work and then to call the callee's home telephone number.

In other implementations, such as with a home computer, only a single telephone line may serve the function of both the communication link **110** and the communication link **132**. Under these circumstances, the caller may use the caller computer **184** to indicate a desire to establish the telephone communication link and then must terminate the communication link **132** so that the central office switch may generate the appropriate signals on the communication link **110** at a point in time when the callee call processing criteria and the caller call processing criteria are both met. It should be further noted that this implementation will preclude the use of the status (i.e., idle or active) of the caller computer **184** since the communication link **132** is not active.

Similarly, the destination telephone **104** and the callee computer **154** may be connected to the central office switch **116** and the Internet **134** via separate communication links (i.e., the communication link **120** and the communication link **132**, respectively). However, the system **100** may also be implemented with a single phone line. The callee may use the callee computer **154** and the communication link **132** to generate or edit the callee call processing criteria in the affiliation list **150**. However, the user must then terminate the communication link **132** to permit the central office switch **116** to establish the communication link **120**. As noted above, a single phone line precludes the use of computer status monitoring (i.e., idle or active) for the callee computer **154** since the status cannot be monitored via the communication link **132**.

The operation of the system **100** to establish a communication link with both the originating telephone **102** and the destination telephone **104** is illustrated in the flowchart of FIG. **10** where, at a start **250**, it is assumed that the caller and callee both have data in their respective affiliation lists. As previously noted, the affiliation list **150** for each individual may comprise separate sublists, such as illustrated in FIG. **5**, or a single data structure containing call processing criteria, such as allowing or blocking individual calls (see FIG. **7**) or establishing conditional criteria, such as time restrictions, current user status (e.g., in a meeting), or the current status of the user's computer (e.g., the idle or active status of the callee computer **154**). Furthermore, as previously noted, user status can be automatically provided to the affiliation list **150** by a computerized schedule program.

In step **252**, the caller indicates a desire to establish a telephone communication link with the callee. In a conventional communication system, the caller picks up the originating telephone and dials the telephone number for the destination telephone **104**. However, in accordance with this aspect of the system **100**, the caller may indicate the desire to establish a telecommunication link using the caller computer **184** and placing the callee telephone number (i.e., the telephone number of the destination telephone **104**) on a call list, such as the forward list **160** (see FIG. **5**). By placing the callee on the forward list, the system **100** can access the callee affiliation list to determine whether the callee computer **154** is active on the Internet.

With the callee telephone number (i.e., the telephone number of the destination telephone **102**) placed on the call list, the system **100** can determine the call processing criteria of both the caller and the callee, and process the request for a telephone call in accordance with those rules. In step **254**, the system **100** establishes a communication link with the Internet **134**. As previously noted, the central office switch **116** may directly establish the communication link **132** with the Internet **134** or may use the SCAI **174** and call processor **176** to communicate with the Internet. It should be noted that the telephone portion of the system may have a continuous data link with the Internet via the central office switch **116** or the call processor **176**. Thus, it is not necessary to continuously establish and tear down the communication link **132**.

In step **258**, the system **100** accesses the callee affiliation list **150**. In step **260**, the system **100** accesses the caller affiliation list **150**. As previously noted, the physical location of each affiliation list in unimportant to the satisfactory operation of the system. The only requirement is that the affiliation list is accessible via the computer network, such as the Internet **134**.

In decision **262**, the system **100** applies the callee call processing criteria and determines whether the present calling conditions meet the callee criteria. This includes testing whether the caller is contained within one of the sublists illustrated in FIG. **5** or if the status associated with the call origination data indicates that the caller is allowed or blocked, or the like. If the present calling conditions do not meet the callee criteria, the result of decision **262** is NO. In that event, the system **100** can return to step **258** to again

access the callee affiliation list. As those skilled in the art can appreciate, the callee affiliation list may be updated by the callee (typically via the callee computer **154**) which may change the result of decision **262**.

If the current call does meet the callee call processing criteria, the result of decision **262** is YES. In that event, the system **100** uses the data from the caller affiliation list **150** to determine whether the present call meets the caller call processing criteria. Although the caller indicated a desire to establish a telephone link with the callee, the caller may not be available for an immediate phone call. For example, the caller may have a meeting scheduled to begin, but expects to be available for a phone call following the meeting. The caller can manually set the call processing criteria, such as indicating the desired time of the telephone call. Alternatively, the caller call processing criteria may be automatically supplied to the caller affiliation list **150** through the use of a computerized scheduling program or the like. The system **100** may also monitor the status of the caller computer **184** to determine caller availability. For example, the caller may indicate an availability for a phone call after a predetermined time. The system **100** can detect the change in the state of the caller computer **184** from the idle state to the active state and interpret that as an indication that the caller is now available for a telephone call. The system can apply these conditions individually or in various combinations to determine the availability of the caller and callee. If the call does not meet the caller call processing criteria, the result of decision **264** is NO. In that event, the system **100** can return to step **258** to access the affiliation lists for the callee and caller, respectively, and thus continuously monitor the callee and caller call processing criteria to determine an appropriate time to make a phone call.

If the call does meet the caller call processing criteria, the result of decision **264** is YES. In that event, in step **266** the system **100** causes the central office switch **116** to send the appropriate ring signals to the originating telephone **102** and ring signals to the destination telephone **104**. In this manner, the telephone system follows the call processing guidelines of both caller and callee stored on a computer network to control the processing of the call on the telephone network.

Although the example illustrated in FIG. **10** illustrates a continuous process of checking call processing criteria against the current call conditions, those skilled in the art appreciate that other possible actions can be taken by the system **100**. For example, the caller may be on the block list **164** (see FIG. **5**). In this condition, the call will never meet the callee call processing criteria. The system **100** thus will never establish a communication link. The system **100** can send a message to the caller computer **184** indicating that the callee does not accept calls in this manner and to leave a message on the voicemail system **180**. Alternatively, the system **100** can establish a telephone communication link to the originating telephone **102** and provide a similar message. As discussed above with respect to FIG. **4**, a variety of voice mail messages can be provided to the user. The system **100** may establish a telephone communication link to the originating telephone **102** and play the appropriate outgoing message **182** (see FIG. **4**). As noted above, the system **100** can apply call processing rules derived from any source, such as the current status (e.g., idle or active) of the callee computer **154** or the caller computer **184**, the presence or absence on one of the sublists in FIG. **5** (e.g., the block list **164**), the status of one party (e.g., the allowed status of the caller), callee or caller status data provided by computerized scheduling systems, or the like. The system **100** advantageously allows multiple forms of call processing criteria to be stored in the network, such as the Internet **134**, and accessed by the telephone system, such as the central office switch **116** or the call processor **176**. Those skilled in the art will also recognize that the embodiment of the system **100** shown in FIG. **9** can be implemented with various telephone system configurations, such as those illustrated in FIGS. **2** and **3**, or any other telephone system configuration. Furthermore, the system **100** is not limited by the specific component of the telephone system that establishes the network link **132** with the affiliation list **150**. Although FIG. **9** illustrates the central office switch **116** or the call processor **176** as the component that establishes the network link, those skilled in the art will recognize that other components, such as the central office switch **106** (see FIG. **2**), the LDC **124**, or the like can establish the network link **132**. Thus, the system **100** is not limited by the specific component of the telephone communication system that establishes the network link **132**.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. For example, the system discussed herein uses, by way of example, the Internet **134** to store the affiliation list **150**. However, the system **100** can be implemented with other computer networks or as a portion of a telephone switch, such as the central office switch **116**. The telephone service provider can provide a customer with an affiliation list and some means to control the list as a value-added telephone service. The central office switch **116** accesses the internal affiliation list and processes the incoming calls in accordance with the user-specified criteria contained therein. Accordingly, the invention is not limited except as by the appended claims.

What is claimed is:

1. In a system that includes a telephone network and a computer network with one or more users, wherein each user is connected through a user computer the computer network and is logically connected through the computer network to the telephone network, a method of determining when to establish telephone communication between two parties, at least one of whom is a user connected to said computer network, comprising:

at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party;

at the computer network, monitoring activity of a user computer connected to the computer network and associated with the second party;

at the computer network, storing a set of pre-determined rules for determining when the second party is available to take a call from the first party;

at the computer network, using the set of a pre-determined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computer of the second party, to determine when the second party is available to take the call originated by the first party; and

using the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party.

2. A method as recited in claim **1**, further comprising, at the computer network, monitor activity of a user computer

connected to the computer network and associated with the first party, wherein using the set of pre-determined rules is also performed using information regarding the monitored activity of the user computer of the first party.

3. A method as recited in claim 1, wherein using the information processed at the computer network to facilitate connecting the call comprises sending control signals to the telephone network to cause the telephone network to connect the call.

4. A method as recited in claim 1, wherein the predetermined rules are associated with an affiliation list of the second party and wherein the first party is referenced by the buddy list.

5. A method as recited in claim 1, wherein monitoring activity of a user computer connected to the computer network and associated with the second party comprises monitoring activity of an input device of the user computer.

6. A method as recited in claim 1, wherein the pre-defined rules specify whether the second party accepts telephone calls from the first party.

7. In a system that includes a telephone network and a computer network with one or more users, and wherein each user is connected through a user computer to the computer network and is logically connected through the computer network to the telephone network, a computer program product comprising:

a computer readable medium for carrying computer executable instructions for implementing at the computer network a method of determining when to establish. telephone communication between two parties, at least one of whom is a user connected to said computer network, and wherein said method comprises:

at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party;

at the computer network, monitoring activity of a user computer connected to the computer network and associated with the second party;

at the computer network, storing a set of predetermined rules for determining when the second party is available to take a call from the first party; and

at the computer network, using the set of predetermined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computer of the second party, to determine when the second party is available to take the call originated by the first party.

8. A computer program product as recited in claim 7, wherein the method further comprises using the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party.

9. A computer program product as recited in claim 7, wherein the pre-determined rules specify whether the second party accepts telephone calls from the first party.

10. A computer program product as recited in claim 7, wherein the pre-determined rules define how the telephone call is to be processed based on the time of the day of the telephone call.

11. A computer program product as recited in claim 7, wherein the method further comprises, at the computer network, monitoring activity of a user computer connected to the computer network and associated with the first party, wherein using the set of pre-determined rules is also performed using information regarding the monitored activity of the user computer of the first party.

12. In a system that includes a telephone network and a computer network with one or more users, and wherein each user is connected through a user computer to the computer network and is logically connected through the computer network to the telephone network, a method of determining when to establish telephone communication between two parties, each of whom is a user connected to said computer network, comprising:

at the computer network, monitoring activity of the user computers associated with both a first and a second party;

at the computer network, receiving information from the telephone network that the first party is originating a call to the second party;

at the computer network, storing a set of pre-determined rules for determining when the second party is available to take a call from the first party;

at the computer network, using the set of pre-determined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computers of the first and second parties, to determine when the second party is available to take the call originated by the first party; and

using the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party.

13. A method as recited in claim 12, wherein using the information processed at the computer network to facilitate connecting the call comprises sending control signals to the telephone network to cause the telephone network to connect the call.

14. A method as recited in claim 12, wherein the predetermined rules are associated with an affiliation list of the second party and wherein the first party is referenced by the buddy list.

15. A method as recited in claim 12, wherein monitoring activity of a user computer connected to the computer network and associated with the second party comprises. monitoring activity of an input device of the user computer associated with the second party.

16. A method as recited in claim 12, wherein the predefined rules specify whether the second party accepts telephone calls from the first party.

17. In a system that includes a telephone network and a computer network with one or more users, and wherein each user is connected through a user computer to the computer network and is logically connected through the computer network to the telephone network, a computer program product comprising:

a computer readable medium for carrying computer executable instructions for implementing at the computer network a method of determining when to establish telephone communication between two parties, each of whom is a user connected to said computer network, wherein said method comprises:

at the computer network, monitoring activity of the user computers associated with both the first and second parties;

at the computer network, receiving information from the telephone network that the first party is originating a call to the second party;

at the computer network, storing a set of predetermined rules for determining when the second party is available to take a call from the first party; and

at the computer network, using the set of pre-determined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computers of the first and second parties, to determine when the second party is available to take the call originated by the first party.

18. A computer program product as recited in claim **17**, wherein the method further comprises using the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party.

19. A computer program product as recited in claim **17**, wherein the pre-determined rules specify whether the second party accepts telephone calls from the first party.

20. A computer program product as recited in claim **17**, wherein the pre-determined rules define how the telephone call is to be processed based on the time of the day of the telephone call.

* * * * *

EXHIBIT 4

US006421439B1

(12) **United States Patent**
Liffick

(10) **Patent No.: US 6,421,439 B1**
(45) **Date of Patent: Jul. 16, 2002**

(54) **SYSTEM AND METHOD FOR USER AFFILIATION IN A TELEPHONE NETWORK**

(75) Inventor: **Stephen Mitchell Liffick**, Seattle, WA (US)

(73) Assignee: **Microsoft Corporation**, Redmond, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/275,689**

(22) Filed: **Mar. 24, 1999**

(51) **Int. Cl.**[7] **H04M 3/42**; G06F 9/46

(52) **U.S. Cl.** **379/211.02**; 379/201.02; 709/328

(58) **Field of Search** 379/201.01, 201.02, 379/201.03, 188, 196, 197, 198, 199, 200, 210.02, 210.03, 211.01, 211.02, 900; 370/352; 709/311, 312, 320, 328

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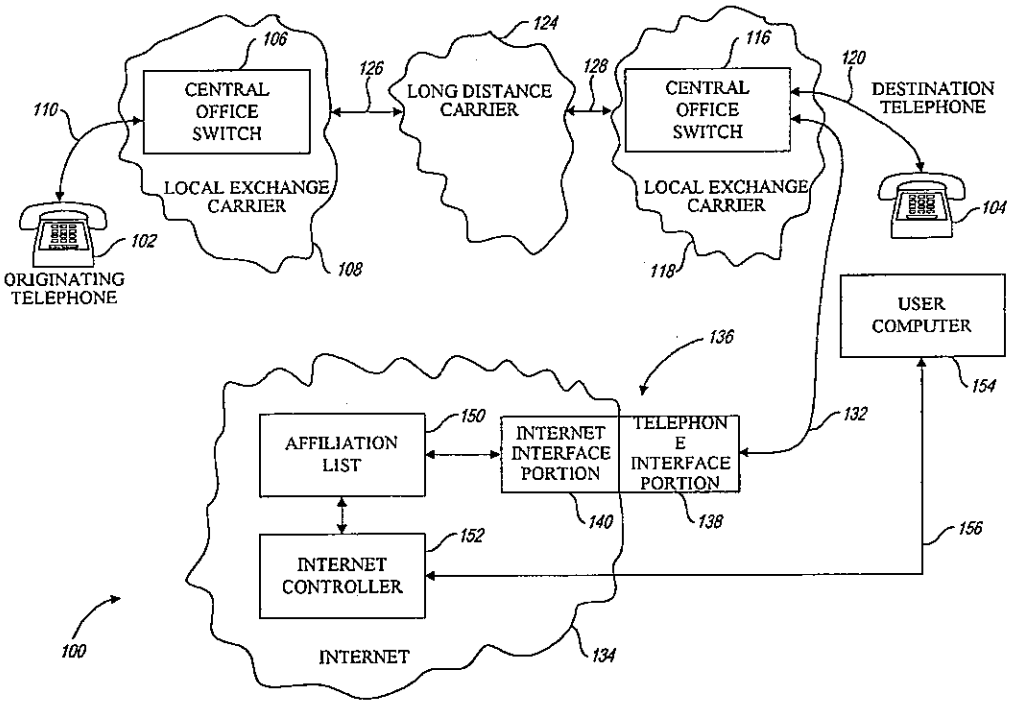
* cited by examiner

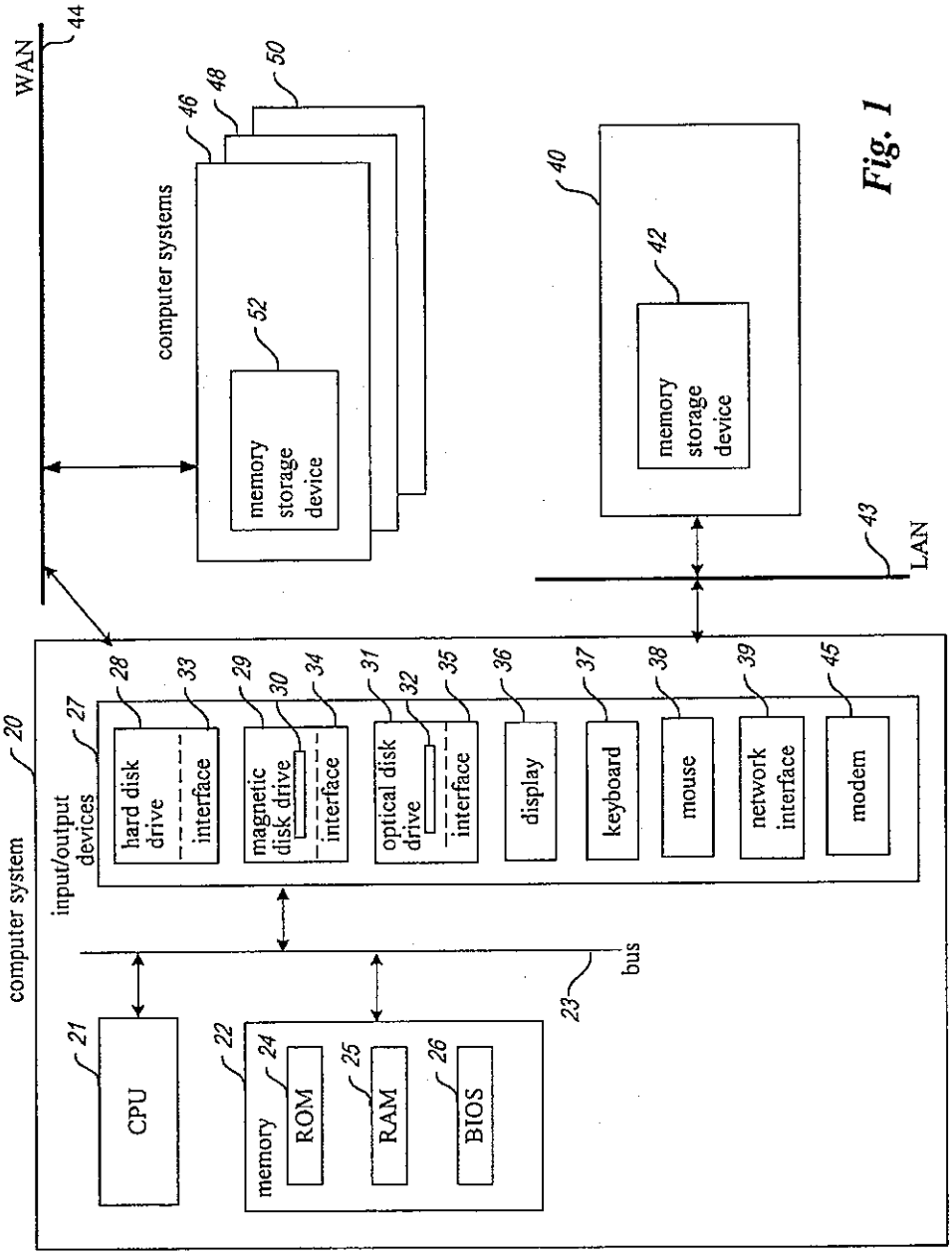
Primary Examiner—Ahmad F. Matar
Assistant Examiner—Benny Q. Tieu
(74) *Attorney, Agent, or Firm*—Workman, Nydegger, Seeley

(57) **ABSTRACT**

A telecommunication system combines telephone technology and Internet technology to establish one or more user-specified affiliation lists. The affiliation lists are stored on the Internet and are accessible by the user and by the telecommunication portion of the system. The affiliation lists are used to process incoming calls to the user's destination telephone number. A central office switch receives the call being directed to the destination telephone number and uses a communication link with the Internet to access the user's affiliation lists. The incoming call is processed in accordance with the user-specified rules in the affiliation lists. The user may accept all incoming calls, no incoming calls, or incoming calls only from specified parties. The call processing rules may be readily edited by the user and can also include alternative call processing rules that vary in accordance with the time of day or with the user's personal desires.

51 Claims, 8 Drawing Sheets




WAN
44
46
48
50
computer systems
52
memory storage device
40
42
memory storage device
43
LAN
20
computer system
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input/output devices
28
hard disk drive
interface
33
29
magnetic disk drive
30
interface
34
31
optical disk drive
32
interface
35
36
display
37
keyboard
38
mouse
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bus
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CPU
22
memory
24
ROM
25
RAM
26
BIOS

Fig. 1

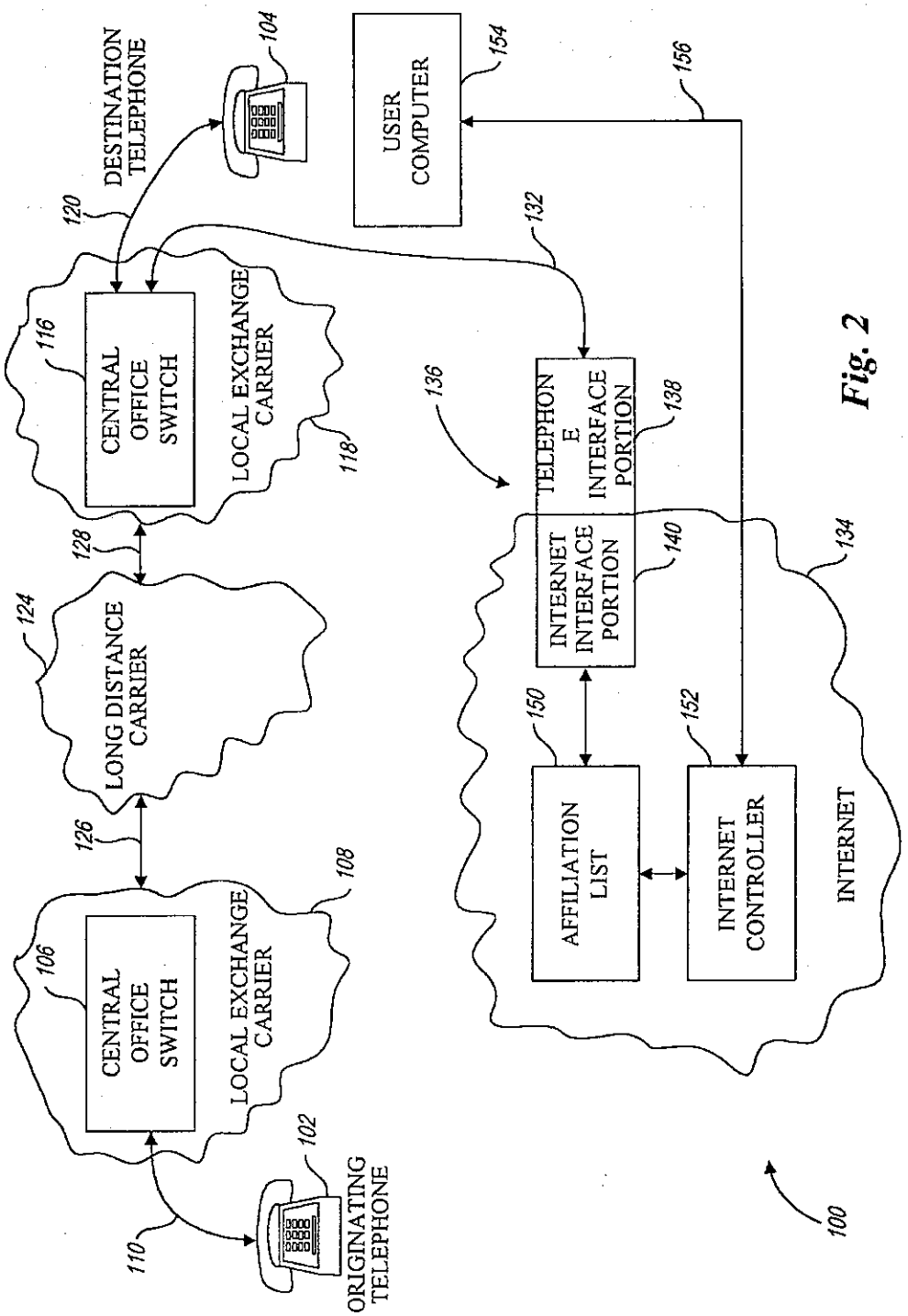

DESTINATION TELEPHONE
104
USER COMPUTER
154
156
120
132
CENTRAL OFFICE SWITCH
116
LOCAL EXCHANGE CARRIER
118
136
TELEPHONE INTERFACE PORTION
138
128
INTERNET INTERFACE PORTION
140
134
LONG DISTANCE CARRIER
124
150
152
126
AFFILIATION LIST
INTERNET CONTROLLER
INTERNET
CENTRAL OFFICE SWITCH
106
LOCAL EXCHANGE CARRIER
108
102
110
ORIGINATING TELEPHONE
100

Fig. 2

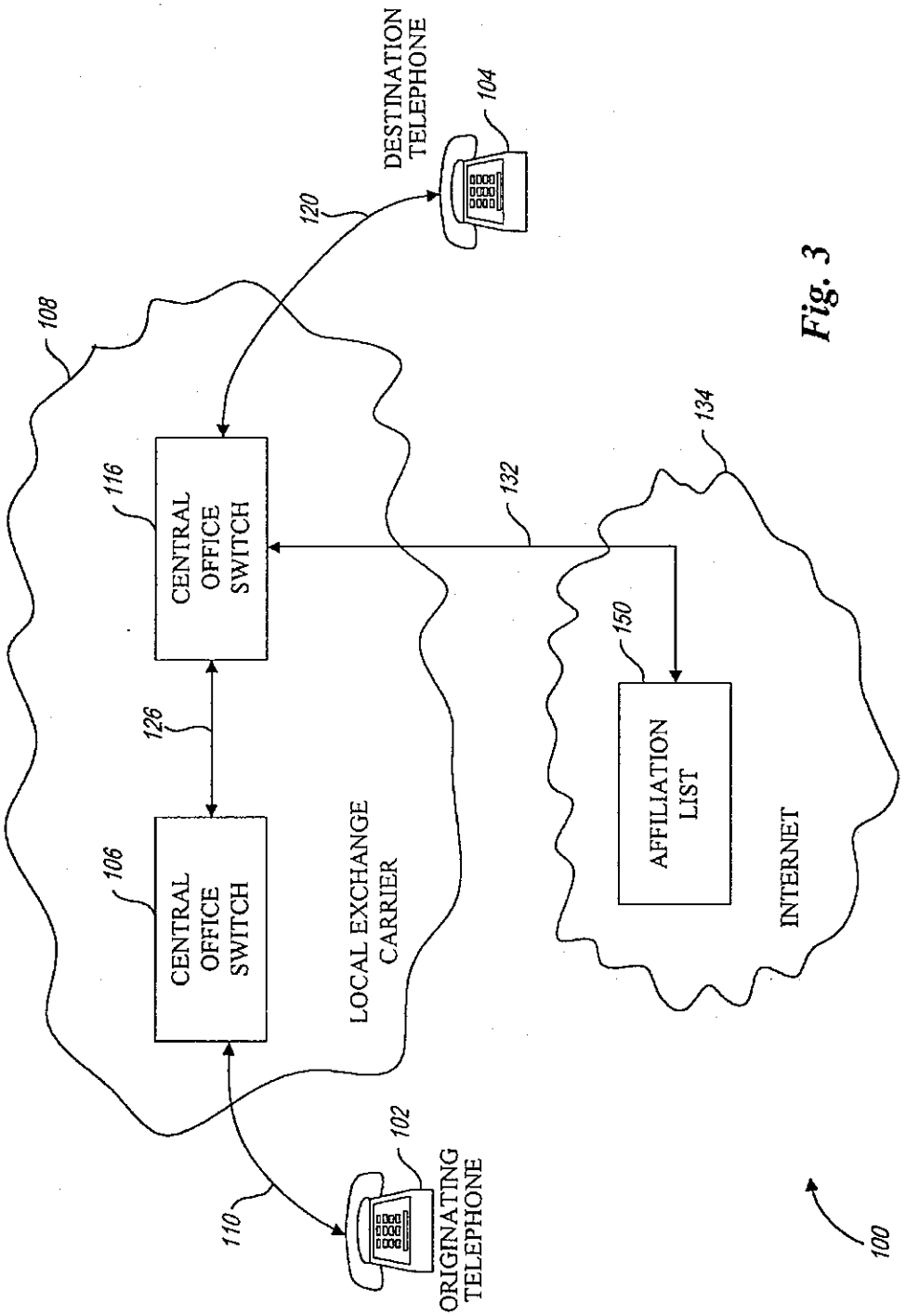

DESTINATION TELEPHONE
104
120
108
116
CENTRAL OFFICE SWITCH
132
134
126
150
AFFILIATION LIST
106
CENTRAL OFFICE SWITCH
LOCAL EXCHANGE CARRIER
INTERNET
102
110
ORIGINATING TELEPHONE
100

Fig. 3

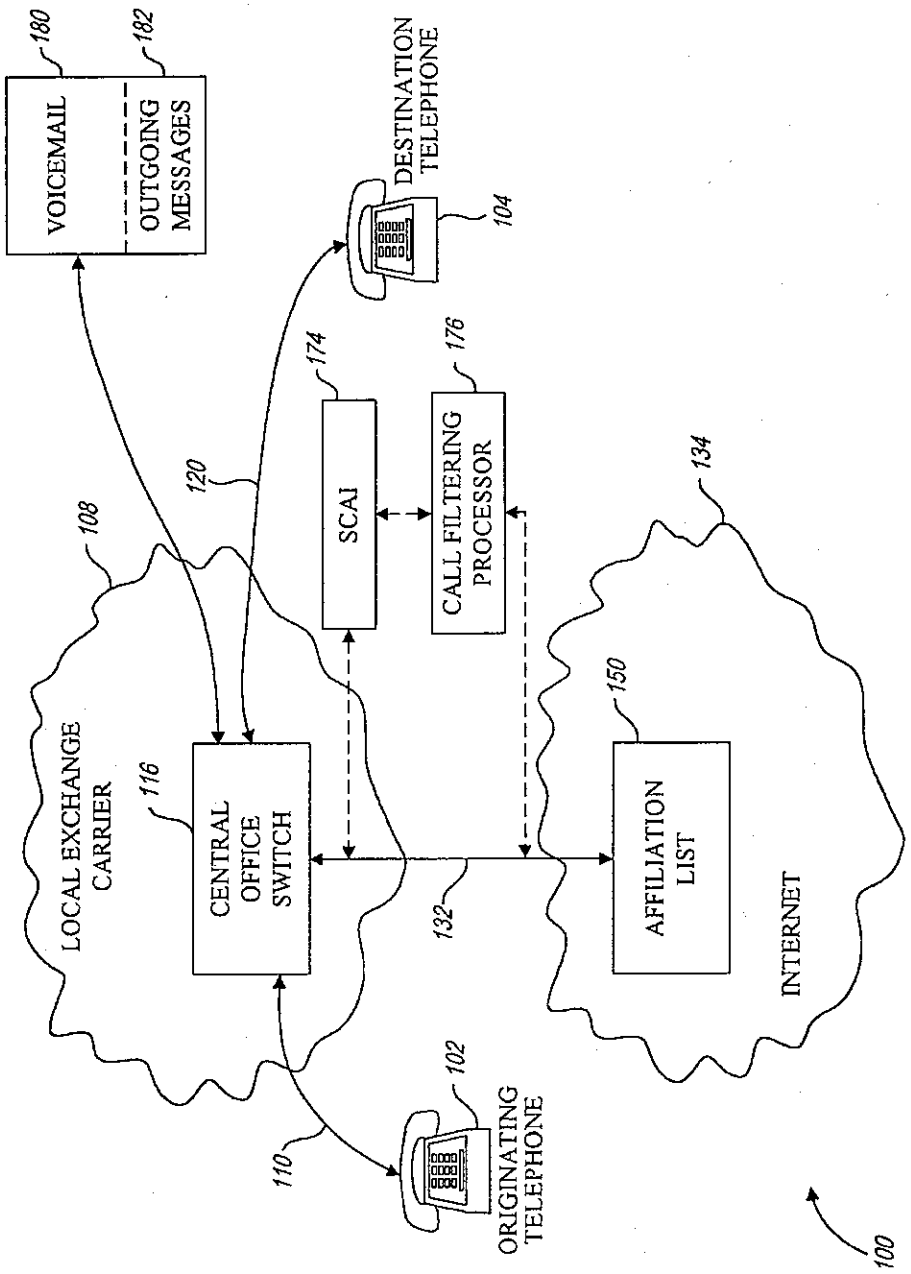

180
182
VOICEMAIL
OUTGOING MESSAGES
DESTINATION TELEPHONE
104
174
176
120
SCAI
CALL FILTERING PROCESSOR
108
134
150
LOCAL EXCHANGE CARRIER
116
CENTRAL OFFICE SWITCH
AFFILIATION LIST
INTERNET
132
102
110
ORIGINATING TELEPHONE
100

Fig. 4

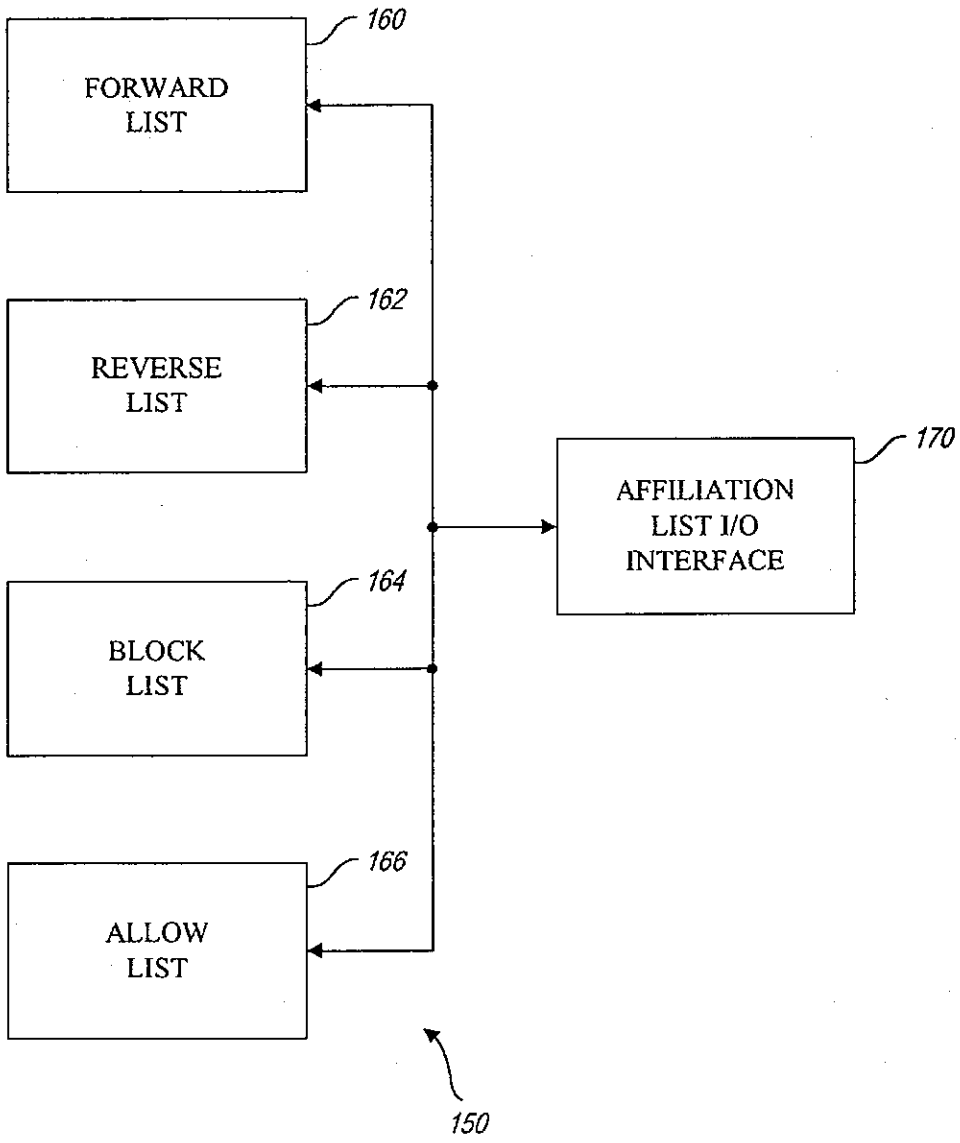

160
FORWARD LIST
162
REVERSE LIST
164
BLOCK LIST
166
ALLOW LIST
170
AFFILIATION LIST I/O INTERFACE
150

Fig. 5

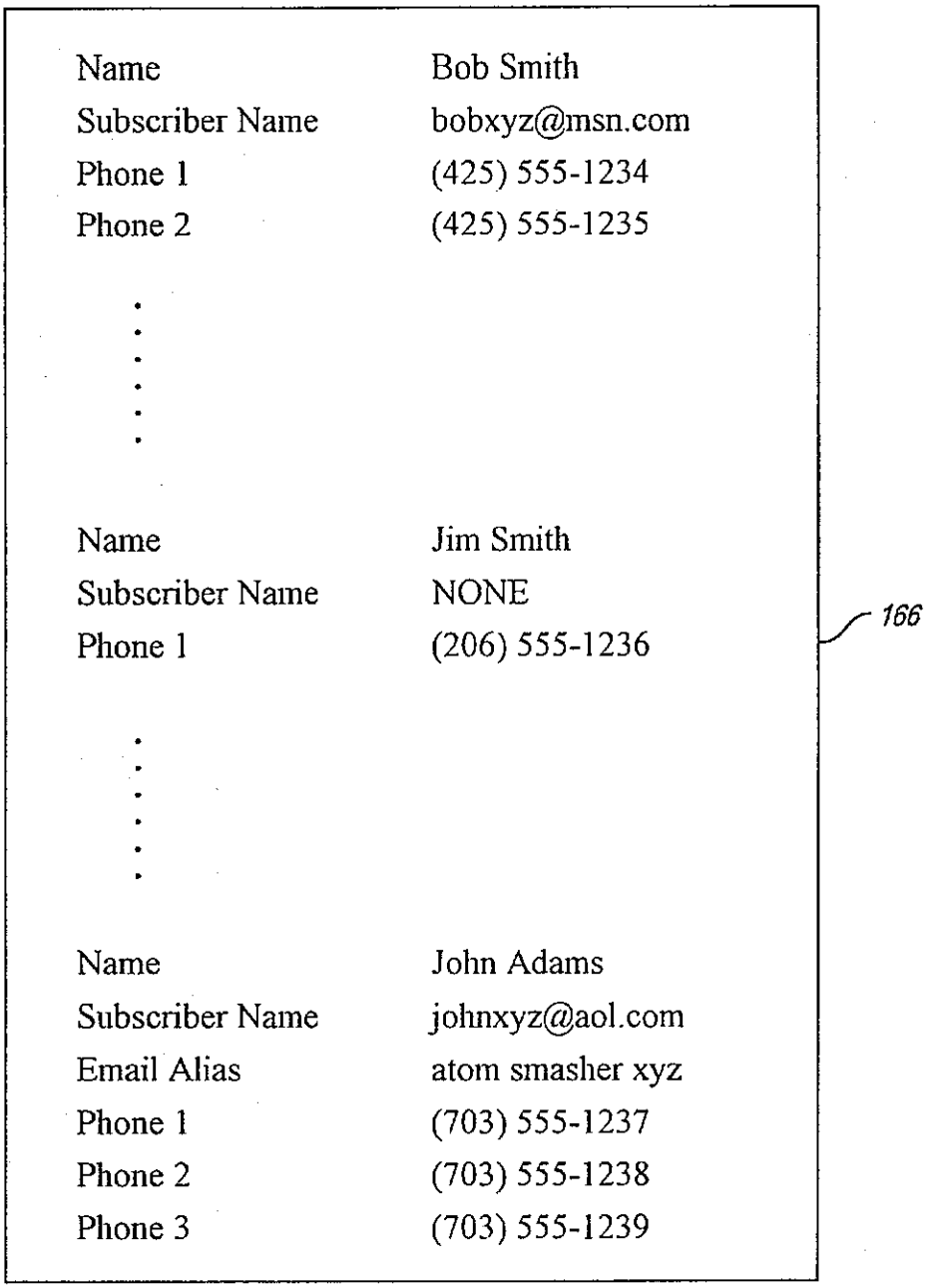

Name Bob Smith
Subscriber Name bobxyz@msn.com
Phone 1 (425) 555-1234
Phone 2 (425) 555-1235
Name Jim Smith
Subscriber Name NONE
Phone 1 (206) 555-1236
166
Name John Adams
Subscriber Name johnxyz@aol.com
Email Alias atom smasher xyz
Phone 1 (703) 555-1237
Phone 2 (703) 555-1238
Phone 3 (703) 555-1239

Fig. 6

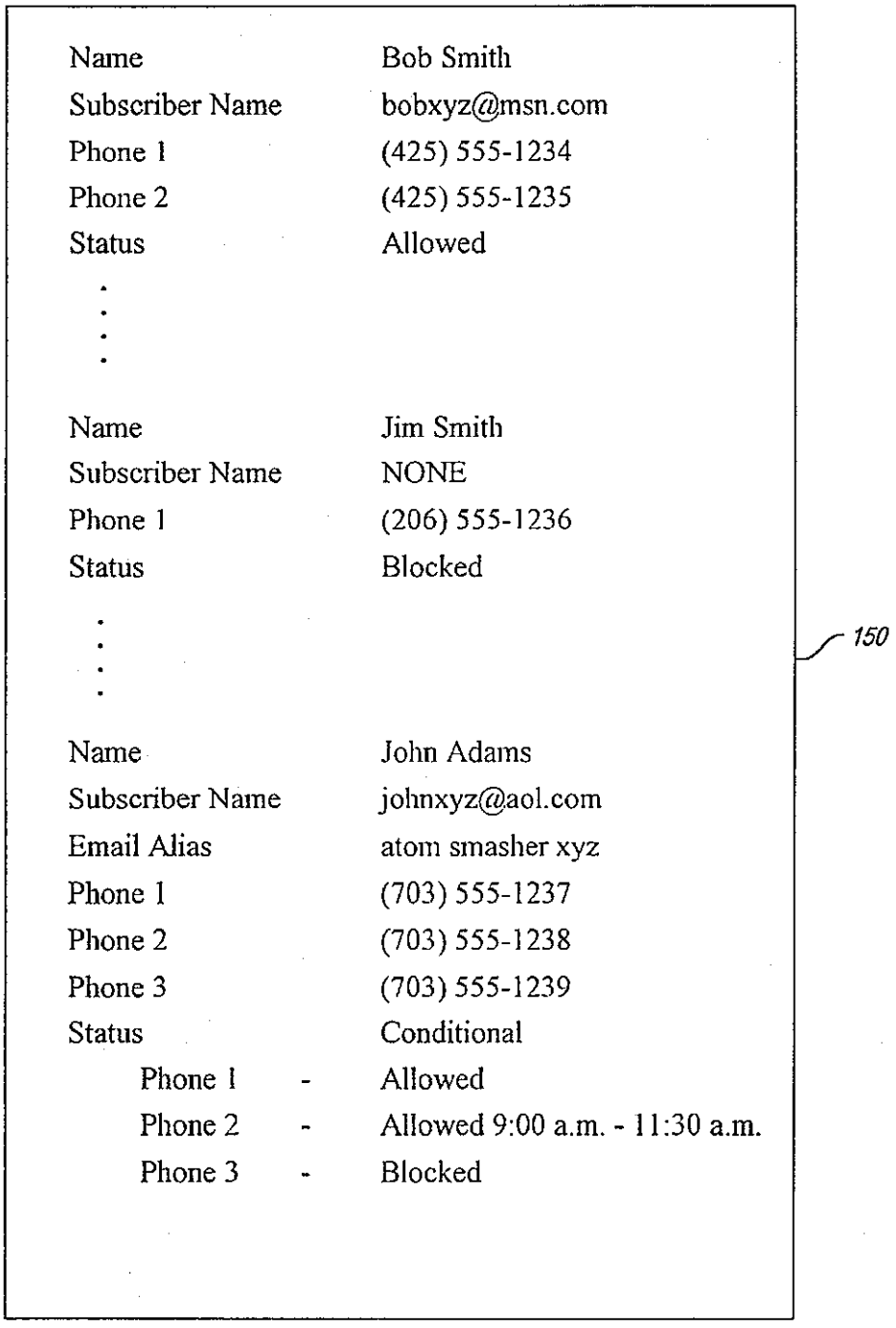

Name Bob Smith
Subscriber Name bobxyz@msn.com
Phone 1 (425) 555-1234
Phone 2 (425) 555-1235
Status Allowed
Name Jim Smith
Subscriber Name NONE
Phone 1 (206) 555-1236
Status Blocked
Name John Adams
Subscriber Name johnxyz@aol.com
Email Alias atom smasher xyz
Phone 1 (703) 555-1237
Phone 2 (703) 555-1238
Phone 3 (703) 555-1239
Status Conditional
Phone 1 - Allowed
Phone 2 - Allowed 9:00 a.m. - 11:30 a.m.
Phone 3 - Blocked
150

Fig. 7

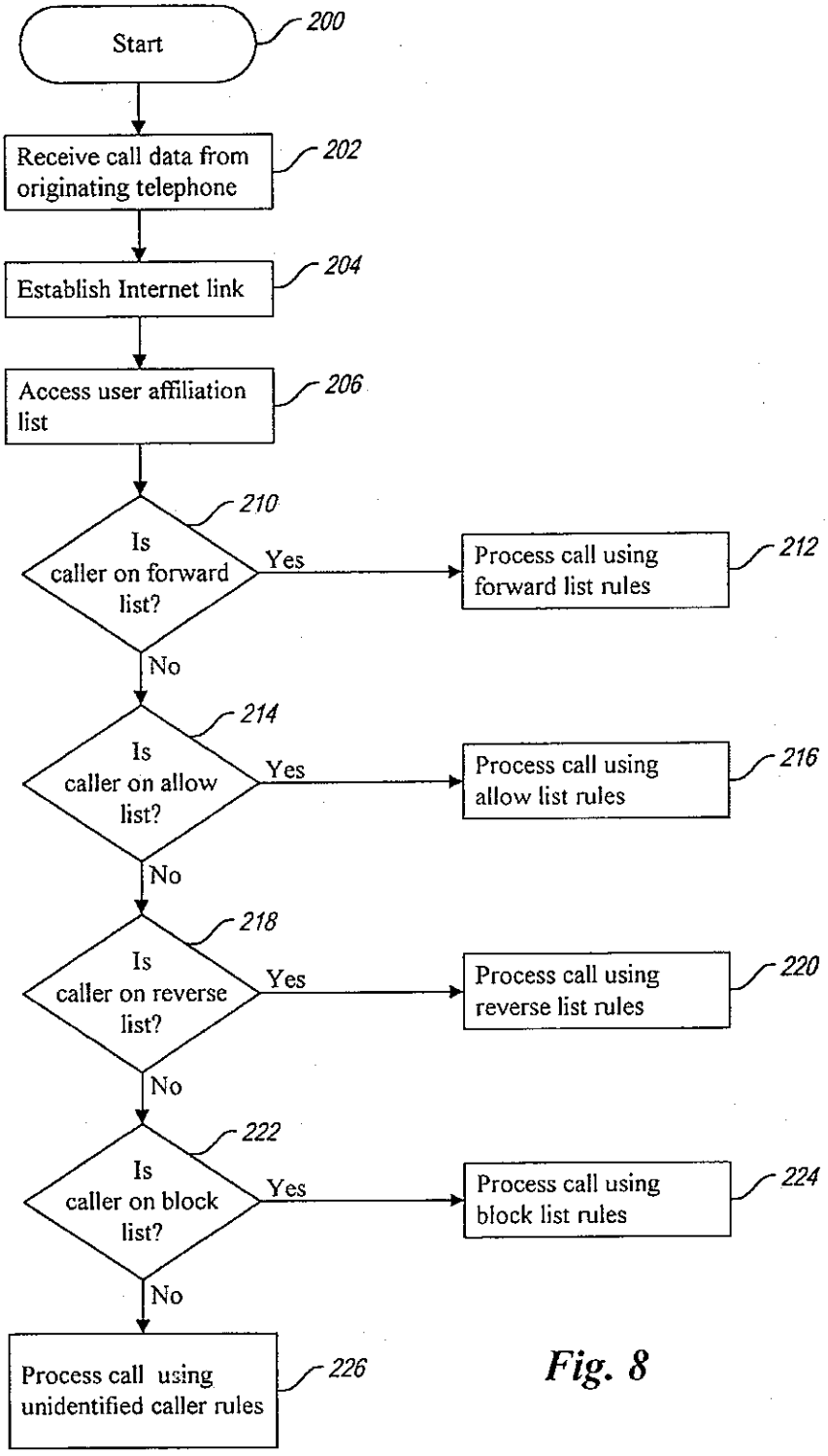

Start
200
Receive call data from originating telephone
202
Establish Internet link
204
Access user affiliation list
206
Is caller on forward list?
210
Yes
Process call using forward list rules
212
No
Is caller on allow list?
214
Yes
Process call using allow list rules
216
No
Is caller on reverse list?
218
Yes
Process call using reverse list rules
220
No
Is caller on block list?
222
Yes
Process call using block list rules
224
No
Process call using unidentified caller rules
226

Fig. 8

SYSTEM AND METHOD FOR USER AFFILIATION IN A TELEPHONE NETWORK

TECHNICAL FIELD

The present invention is directed generally to telecommunications and, more particularly, to a system and method for user selection of individual affiliations in a telephone network.

BACKGROUND OF THE INVENTION

Advances in telecommunication technology provide a user with a broad variety of communication options. For example, advances in telephone communication, including wireless telephone and cellular telephone, allow almost instantaneous communication between virtually any two locations on earth. Telephone service providers typically offer wide range of options, such as voice mail, caller identification, call waiting, call forwarding, three-way calling, and the like. The telephone service subscriber can customize their own telecommunications service with the selection of one or more options.

Despite these advances, the user is still limited in determining with whom the user wishes to speak and when the user wishes to speak with certain parties or, at the user's option, not speak with certain parties. Although caller identification (ID) can identify the calling party, caller ID does not always correctly identify the caller. For example, if the number identification data is not transmitted along with the call, the caller ID device indicates that caller data is "unavailable." In addition, the user must still respond to the ringing telephone and view the caller identification box to determine whether or not to answer the telephone. Thus, existing telephone technologies do not always provide user with the desired degree of control over incoming calls.

Therefore, it can be appreciated that there is a significant need for system and method to control incoming calls to a user's telephone. The present invention provides this and other advantages as will be apparent from the following detailed description and accompanying figures.

SUMMARY OF THE INVENTION

A system to specify user-selectable criteria for call processing is implemented on a conventional telephone system, such as a public switched telephone network (PSTN). The user-specified call processing criteria is stored on a network that is accessible by the user for data entry and/or editing, and is also accessible by the PSTN to determine whether call processing criteria exists for the particular caller. The Internet provides a readily available data structure for storage of the user-selectable call processing criteria. The user can establish a database stored on the Internet in association with the user's telephone number and indicating the user-selectable call processing criteria for one or more potential callers.

The caller may be identified by caller identification data, such as automatic number identification (ANI). Based on the destination telephone number and the caller identification data, the PSTN accesses the Internet and examines an affiliation list corresponding to the destination telephone number. If the caller identification data is present in the affiliation list, the call may be processed in accordance with the user-specified criteria for that particular caller.

The user (i.e., the called party) can specify user-selectable call processing criteria for all incoming calls, incoming calls from selected callers, and may further apply conditional criteria based on user preferences. For example, the user may select all calls during certain times of the day, calls from selected parties during other specified times of the day, and no calls during other times of the day. The user-selectable call processing criteria may be readily edited by the user and may be applied to multiple phone numbers associated with a particular caller.

The system may be readily implemented on current telephone systems with no significant modifications. For example, the system may apply the user-specified call processing criteria at the central office switch to which the destination telephone is coupled. All call processing prior to arrival at that central office switch is performed in accordance with conventional telecommunication techniques and standards. When a call arrives at the central office switch coupled to the destination telephone, the central office switch does not immediately establish a communication link with the destination telephone, but accesses the user-specified call processing criteria on the Internet and applies the call processing criteria. If the call is allowed, the central office switch establishes a communication link with the destination telephone in a conventional fashion to complete the telephone call. If the call is not allowed, the central office switch will not process the call, and may generate a busy signal to indicate that the user is unavailable.

The system may also be implemented at other points in the telecommunication network, such as a central office switch at the originating telephone. In addition, the user-specified call processing criteria may be stored on other forms of networks that are accessible to both the user (i.e., the called party) and the telecommunication system.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a computer system that includes components to implement the system of the present invention.

FIG. 2 is a functional block diagram outlining the operation of the present invention.

FIG. 3 is a functional block diagram of an alternate telecommunications configuration implementing the present invention.

FIG. 4 is a functional block diagram of another alternative telecommunications configuration implementing the present invention.

FIG. 5 is a functional block diagram providing details of the affiliation list of the system of FIG. 2.

FIG. 6 illustrates sample data provided in the list of FIG. 5.

FIG. 7 illustrates additional sample data provided in the list of FIG. 3.

FIG. 8 is a flowchart illustrating the operation of the system of FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

Existing telephone technology does not provide the telephone subscriber with a technique for controlling access to the user's telephone. Features such as caller ID identify the caller, but do not control access to the user's telephone. Thus, the conventional telephone system forwards the user to extreme options. The user may answer all incoming calls or may choose not to answer any incoming calls. However, the present invention provides selective options in between these two extremes. The present invention combines telephone technology with Internet technology to allow the user to "filter" incoming calls based on user-selected criteria. In

particular, the user may establish a series of lists, stored on the Internet in association with the user's telephone, to filter incoming calls and thereby control access to the user's telephone.

FIG. **1** and the following discussion are intended to provide a brief, general description of a suitable computing environment in which the invention may be implemented. Although not required, the invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a personal computer. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention may be practiced with other computer system configurations, including hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, and the like. The invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

With reference to FIG. **1**, an exemplary system for implementing the invention includes a general purpose computing device in the form of a conventional personal computer **20**, including a processing unit **21**, a system memory **22**, and a system bus **23** that couples various system components including the system memory to the processing unit **21**. The system bus **23** may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory **22** includes read only memory (ROM) **24** and random access memory (RAM) **25**. A basic input/output system **26** (BIOS), containing the basic routines that helps to transfer information between elements within the personal computer **20**, such as during start-up, may be stored in ROM **24**.

The personal computer **20** further includes input/output devices **27**, such as a hard disk drive **28** for reading from and writing to a hard disk, not shown, a magnetic disk drive **29** for reading from or writing to a removable magnetic disk **30**, and an optical disk drive **31** for reading from or writing to a removable optical disk **32** such as a CD ROM or other optical media. The hard disk drive **28**, magnetic disk drive **29**, and optical disk drive **31** are connected to the system bus **23** by a hard disk drive interface **33**, a magnetic disk drive interface **34**, and an optical drive interface **35**, respectively. The drives and their associated computer-readable media provide nonvolatile storage of computer readable instructions, data structures, program modules and other data for the personal computer **20**. Although the exemplary environment described herein employs a hard disk, a removable magnetic disk **30** and a removable optical disk **32**, it should be appreciated by those skilled in the art that other types of computer readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, random access memories (RAMs), read only memories (ROM), and the like, may also be used in the exemplary operating environment. Other I/O devices **27**, such as a display **36**, keyboard **37**, mouse **38**, and the like may be included in the personal computer **20** and function in a known manner. For the sake of brevity, other components, such as a joystick, sound board and speakers are not illustrated in FIG. **1**.

The personal computer **20** may also include a network interface **36** to permit operation in a networked environment using logical connections to one or more remote computers, such as a remote computer **40**. The remote computer **40** may be another personal computer, a server, a router, a network PC, a peer device or other common network node, and typically includes many or all of the elements described above relative to the personal computer **20**, although only a memory storage device **42** has been illustrated in FIG. **1**. The logical connections depicted in FIG. **1** include a local area network (LAN) **43** and a wide area network (WAN) **44**. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets and the Internet.

When used in a LAN networking environment, the personal computer **20** is connected to the LAN **43** through the network interface **39**. When used in a WAN networking environment, the personal computer **20** typically includes a modem **45** or other means for establishing communications over the wide area network **44**, such as the Internet. The modem **45**, which may be internal or external, permits communication with remote computers **46–50**. In a networked environment, program modules depicted relative to the personal computer **20**, or portions thereof, may be stored in the remote memory storage device **42** via the LAN **51** or stored in a remote memory storage device **52** via the WAN **44**. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

The present invention is embodied in a system **100** illustrated in the functional diagram of FIG. **2**. In a typical telephone communication, an originating telephone **102** is operated by a calling party to place a call to a destination telephone **104**. The originating telephone generates signals that are detected by a central office switch **106** operated by a local exchange carrier (LEC) **108**. The LEC **108** is the telephone service provider for the calling party. The originating telephone **102** is coupled to the central office switch **106** via a communication link **110**. As those skilled in the art can appreciate, the communication link **110** may be a hard-wired connection, such as a fiber optic, copper wire, or the like. Alternatively, the communication link **110** may be a wireless communication link if the originating phone **102** is a cellular telephone or some other form of wireless telephone.

Similarly, the destination telephone **104** is coupled to a central office switch **116** operated by a local exchange carrier (LEC) **118**. The destination telephone **104** is coupled to the central office switch **116** via a communication link **120**. The communication link **120** may be a hard-wired communication link or a wireless communication link, as described above with respect to the communication link **110**. The present invention is not limited by the specific form of communication link or central office switch.

The LEC **108** establishes a communication link with the LEC **118**. As illustrated in FIG. **2**, the communication link between the LEC **108** and the LEC **118** is through a long distance carrier (LDC) **124**. The LEC **108** establishes a communication link **126** with the LDC **124** which, in turn, establishes a communication link **128** with the LEC **118**. If the telephone call from the originating telephone **102** to the destination telephone **104** is not a long distance call, the LDC **124** is not required. In this case, the communication link **126** may couple the LEC **108** directly to the LEC **118**. The use of the system **100** with other telephone configurations are illustrated in other figures.

To place a telephone call, the calling party activates the originating telephone **102** to dial in the telephone number

corresponding to the destination telephone number **104**, thereby establishing the communication link **110** with the central office switch **106**. In true, the central office switch **106** establishes the communication link **126** (via the LDC **124**, if necessary), thus establishing a communication link with the central office switch **116**. In a conventional telephone system, the central office switch **116** establishes the communication link **120** to the destination telephone **104** causing the destination telephone to ring. If the subscriber picks up the destination telephone, a complete communication link between the originating telephone **102** and the destination telephone **104** has been established. This is sometimes referred to as "terminating" the telephone call. The specific telecommunications protocol used to establish a telephone communication link between the originating telephone **102** and the destination telephone **104** is well known in the art and need not be described herein. The preceding description of techniques used to establish the telephone communication link are provided only as a basis for describing the additional activities performed by the system **100**.

With the system **100**, the central office switch **116** does not initially establish the telephone communication link **120** with the destination telephone **104** to cause the telephone to ring. Instead, the central office switch **116** establishes a communication link **132** with a computer network **134**, such as the Internet. As those skilled in the art can appreciate, the Internet is a vast multi-computer network coupled together by data links having various communication speeds. Although the Internet **134** may use a variety of different communication protocols, a well-known communication protocol used by the Internet is a Transmission Control Protocol/Internet Protocol (TCP/IP). The transmission of data on the Internet **134** using the TCP/IP is known to those skilled in the art and need not be described in greater detail herein.

The central office switch **116** utilizes conventional telephone communication protocols, which may be different from the TCP/IP communication protocols used by the Internet **134**. The system **100** includes a communication interface **136** to translate data between the two communication protocols. The communication interface **136** includes a telephone interface portion **138** and an Internet interface portion **140**. The telephone interface portion **138** is coupled to the central office switch **116** via the communication link **132** such that communications occurring on the communication link **132** utilize the telephone communication protocol. The Internet interface portion **140** communicates via the Internet using conventional communication protocols, such as TCP/IP.

The communication interface **136** may be implemented on a computing platform that functions as a server. The conventional components of the computing platform, such as a CPU, memory, and the like are known to those skilled in the art and need not be described in greater detail herein. The telephone interface portion **138** may comprise an Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) to communicate with the central office switch **116**. The ISDN PRI, which may be implemented on a plug-in computer card, provides information to the telephone interface portion **138**, such as automatic number identification (ANI), dialed number identification service (DNIS), and the like. As is known, ANI provides the telephone number of the caller's telephone (e.g., the originating telephone **102**) while the DNIS allows the number the caller dialed (e.g., the destination telephone **104**) to be forwarded to a computer system. These data may be considered "keys" which may be used by the system **100** to identify the caller and the callee. Thus, the central office switch **116** provides information which may be used to access the affiliation list **150** for the destination telephone **104**.

The Internet interface portion **140** may be conveniently implemented with a computer network card mounted in the same computing platform that includes the ISDN PRI card. However, it is not necessary for satisfactory operation of the system **100** that the interface cards be co-located in the same computing platform. It is only required that the telephone interface portion **138** communicate with the Internet interface portion **140**. The Internet interface portion **140** receives the incoming data (e.g., the ANI, DNIS, and the like) and generates Internet compatible commands. The specific form of the Internet commands using, by way of example, TCP/IP, are within the scope of knowledge of one skilled in the art and need not be described herein. As will be described below, data provided by the central office switch **116** will be used to access data on the Internet and use that data to determine the manner in which a telephone call will be processed.

The Internet **134** stores an affiliation list **150**, which may be established by the user of the destination telephone **104**. Data stored within the affiliation list **150** is accessed by the central office switch **116** to determine the manner in which the call from the originating telephone **102** will be processed. Details of the affiliation list **150** are provided below. The Internet **134** also includes an Internet controller **152** which communicates with a user computer **154** via a network link **156**. The communication between the user computer **154** and the Internet **134** is a conventional communication link used by millions of computers throughout the world. For example, the user computer **154** may be a personal computer (PC) containing a communication interface, such as a modem (not shown). The network link **156** may be a simple telephone communication link using the modem to communicate with the Internet **134**. The Internet controller **152** functions in a conventional manner to communicate with the user computer **154** via the network link **156**. Although the communication link **132** and the network link **156** are both communication links to the Internet, the network link **156** is a conventional computer connection established over a telephone line, a network connection, such as an Ethernet link, or the like. This conventional network link **156** is significantly different from the communication link **132** between the central office switch **116** and the Internet **134**. The central office switch **116** establishes the communication link **132** to access data on the Internet and uses that accessed data to determine how to process an incoming call for the destination telephone **104**. The network link **156** is a computer-to-computer connection that may simply use a telephone as the physical layer to establish the network link.

In the system **100**, the central office switch **116** receives an incoming call from the originating telephone **102** via the central office switch **106** and, optionally, the LDC **124**. Rather than immediately establishing the communication link **120** and generating a ring signal at the destination telephone **104**, the central office switch **116** establishes the communication link **132** and communicates with the Internet **134** via the communication interface **136**. The purpose of such communication is to access the affiliation list **150** and thereby determine the manner in which the user of the destination telephone **104** wishes calls to be processed.

FIG. **3** illustrates the system **100** for a telephone system configuration in which the originating telephone **102** and the

destination telephone **104** are both serviced by the same local exchange carrier **108**. The originating telephone **102** establishes the communication link **110** with the central office switch **106** in the manner described above. The central office switch **106** establishes the communication link **126** directly with the central office switch **116** without the need for the LDC **124** (see FIG. **2**). The central office switch **116** operates in the manner described above. That is, the central office switch **116** does not immediately establish the communication link **120**, but does establish the communication link **132** with the Internet **134**. For the sake of simplicity, FIG. **3** does not illustrate the communication interface **136**. However, those skilled in the art will appreciate that the central office switch **116** accesses the affiliation list **150** via the communication interface **136** (see FIG. **2**).

For the sake of simplicity, FIG. **3** also does not show the Internet controller **152** and the user computer **154**. However, those skilled in the art can appreciate that those portions of the system may also be present in the embodiment illustrated in FIG. **3**. However, it should be noted that the user computer **154** and the Internet controller **152** need only be used to edit the affiliation list **150**. The call processing by the central office switch **116** does not depend on the presence of the Internet controller **152** or the user computer **154**. That is, the central office switch **116** accesses the affiliation list **150** via the communication interface **136** regardless of the presence of the user computer **154**.

In yet another telephone system configuration, illustrated in FIG. **4**, the originating telephone **102** and the destination telephone **104** are not only serviced by the same local exchange carrier **108**, but are connected to the same central office switch **116**. However, the fundamental operation of the system **100** remains identical to that described above with respect to accessing the affiliation list **150**. That is, the originating telephone **102** establishes the communication link **110** with the central office switch **116**. However, the central office switch **106** need not establish the communication link **126** with any other central office switch since the destination telephone **104** is also connected to that same central office switch.

In this telephone system configuration, the central office switch **116** accesses the affiliation list **150** on the Internet **134** via the communication link **132** (see FIG. **2**) in the manner described above. For the sake of simplicity, FIG. **4** does not illustrate the communication interface **136**. However, those skilled in the art will recognize that the communication interface **136** operates to convert communication signals between telephone protocol used by the central office switch **106** and the Internet communication protocol used by the Internet **134**. In addition, FIG. **4** also does not illustrate the Internet controller **152** and the user computer **154**. As noted above with respect to FIG. **3**, the Internet controller **152** and user computer **154** are not necessary for proper operation of the system **100**. The user computer **154** is typically used in the system **100** to edit the affiliation list **150**.

The affiliation list **150** is illustrated in greater detail in the functional block diagram of FIG. **5**. The affiliation list comprises a series of sublists, illustrated in FIG. **3** as a forward list **160**, a reverse list **162**, a block list **164**, and an allow list **166**. The forward list **160** contains a list of Internet subscribers whose Internet activity a user wishes to monitor. This list is sometimes referred to as a "buddy" list. When the user operates the user computer **154** on the Internet **134**, the Internet controller **152** accesses the forward list **160** via an affiliation list input/output (I/O) interface **170** to determine which Internet subscribers contained within the forward list are currently active on the Internet **134**. In conventional Internet operation, the Internet controller **152** sends a message to the user computer **154** indicating which Internet subscribers on the forward list **160** are currently active on the Internet **134**.

The forward list **160** is a list of Internet subscribers whose activity is reported to the user. Other Internet subscribers may have their own forward list (not shown) and may monitor the Internet activity of the user. When the user accesses the Internet **134** with the user computer **154**, that activity can be monitored by others. With the system **100**, it is possible to determine who is monitoring the user's Internet activity. The reverse list **162** contains a list of Internet subscribers who have placed the user in their forward list. That is, the reverse list **162** contains a list of Internet subscribers who have placed the user in their buddy list. With the reverse list **162**, the user can determine who is monitoring his Internet activity.

The block list **164** contains a list of Internet subscribers that the user does not want to monitor his Internet activity. That is, the user's Internet activity will not be provided to any Internet subscriber contained in the block list **164**. Thus, even if a particular Internet subscriber has placed the user on their forward list, the presence of that particular Internet subscriber's name on the block list **164** will prevent the user's Internet activity from being reported to the particular Internet subscriber. The use of the block list **164** provides certain security assurances to the user that their Internet activity is not being monitored by any undesirable Internet subscribers.

The allow list **166** contains a list of Internet subscribers for whom the user may wish to communicate with but whose Internet activity the user does not wish to monitor.

The system **100** combines the capabilities of the affiliation list **150** with telephone switching technology to filter incoming calls to the destination telephone **104**. For example, the user may specify that only calls from Internet subscribers contained in the forward list **154** may contact the user via the destination telephone **104**. Alternatively, the user may specify that a calling party whose name is contained in the forward list **160** or the allow list **166** may place a call to the destination telephone **104**. As will be discussed in greater detail below, the system **100** allows the user to create general conditional processing, such as blocking calls or allowing calls. However, the user can also create specific conditional processing for individual callers or based on the user's current status or preferences.

The central office switch **116** accesses the affiliation list **150** via the communication link **132** and determines whether the calling party is in a list (e.g., the forward list **160**) that the user wishes to communicate with. If the calling party is contained within an "approved" list, the central office switch **116** establishes the communication link **120** and sends a ring signal to the destination telephone **104**. Thus, the user can pick up the telephone with the knowledge that the calling party is an individual with whom the user wishes to communicate.

Conversely, if the calling party is not contained within an approved list, such as the forward list **160** or the allow list **166**, the central office switch **116** will not establish the communication link **120** with the destination telephone **104**. Thus, the user will not be bothered by undesirable phone calls. In one embodiment, the central switch office simply will not establish the communication link **120** and the calling party will recognize that the call did not go through. Alternatively, the central office switch **116** may generate a

signal indicating that the destination telephone **104** is busy. In this alternative embodiment, the calling party will receive a busy signal on the originating telephone **102**. Thus, the user has the ability to filter incoming calls by creating a list of those individuals with whom the user wishes to communicate.

It should be noted that the affiliation list **150** may be dynamically altered by the user to add or delete individuals, change individuals from one list to another, or to change the call processing options for a particular list depending on the user's preferences. For example, the user may want to accept all calls from any source at certain times of the day. Under these circumstances, the user can edit the allow list **166** to accept calls from any calling party. Alternatively, the user may still maintain the block list **164** such that calls will not be processed from certain specified parties even if the user is willing to accept calls from any other source. Under other circumstances, the user may not wish to communicate with any individuals. In this instance, the user may indicate that all calling parties are on the block list **164**. Thus, the central office switch **116** will access the Internet **134** in real-time and review data in the affiliation list **150** to thereby process incoming calls for the user in accordance with the rules present in the affiliation list.

The discussion above provides examples of the central office switch **116** processing calls from a calling party in accordance with their presence or absence of certain lists in the affiliation list **150**. For example, a call from a party on the forward list **160** will be connected to the destination telephone **104** (see FIG. **2**) while a call from a party on the block list **164** will not be put through to the destination telephone. However, the system **100** also allows the selection of call processing options on an individual basis rather than simply on the presence or absence in a particular list. For example, the user can edit the allow list **166** to specify that certain individuals are "allowed" while other individuals may be allowed, conditionally allowed, or blocked all together. If the individual calling party has an associated status indicating that they are allowed, the central office switch **116** will process the incoming call and connect it to the destination telephone **104**. If the individual calling party has an associated blocked status, the central office switch **116** will not process the call and will not connect it to the destination telephone **104**.

Furthermore, the user may attach conditional status to individual callers or to calling lists. Conditional status may be based on factors, such as the time of day, current availability of the user, work status, or the like. For example, the user may accept calls from certain work parties during specified periods of the day (e.g., 9:00 a.m.–11:00 a.m.), block calls from selected calling parties during other periods of time (e.g., 12:00–1:00 p.m.), or allow calls during a business meeting only from certain calling parties (e.g., the boss). These conditional status criteria may be applied to individuals or to one or more lists in the affiliation list **150**.

FIG. **6** illustrates sample data entries in the allow list **166**. The allow list **166** may include data, such as a name, Internet subscriber name, and one or more phone numbers associated with the individual data entry. It should be noted that the calling party need not have an Internet subscriber name for proper operation of the system **100**. That is, the central office switch **116** accesses the allow list **166** utilizing the calling party number and need not rely on any email addresses or other Internet subscriber identification for proper operation. The allow list **166** may also include an email alias in addition to or in place of the Internet subscriber name. Some Internet subscribers prefer to "chat" with other subscribers utilizing an alias rather than their actual Internet subscriber name. The data of FIG. **6** illustrates one possible embodiment for the allow list **166**. However, those skilled in the art can appreciate that the allow list **166** may typically be a part of a large database (not shown). Database operation is well known in the art, and need not be described in greater detail herein. The database or other form of the forward list **160** may be satisfactorily implemented using any known data structure for storage of data. For example, the various lists (e.g., the allow list **166**, the reverse list **162**, the block list **164** and the allow list **166**) may all be integrated within a single database structure. The present invention is not limited by the specific structure of the affiliation list **150** nor by the form or format of data contained therein.

Rather than incoming call filtering on the basis of presence in a particular list, such as the allow list **166**, as illustrated in FIG. **6**, the affiliation list **150** may contain status data on an individual basis. In this event, the central office switch **116** (see FIG. **2**) processes the incoming call in accordance with the designated status for that individual. In the example illustrated in FIG. **7**, the affiliation list **150** contains one individual with an "allowed" status, one individual with a "blocked" status, and one individual with a "conditional" status based on user-selected criteria. In the example of FIG. **7**, the user-selected criteria may be based on the particular phone from which the call is originating as well as the time of day in which the call is originated. For example, the user may wish to allow all calls from a particular number, such as an caller's work number. However, calls from another number, such as the caller's home phone, may be blocked. Other calls, such as from a caller's cellular telephone, may be allowed only at certain times of day. FIG. **7** is intended to illustrate some of the call processing options that are available to the user. As can be appreciated, a variety of different conditional status criteria may be applied to one or more potential calling parties. However, a common feature of the system **100** is that the telecommunication system (e.g., the central office switch **116**) determines calling party status on the basis of information stored on the Internet and processes the incoming call in accordance with the user-specified criteria. Moreover, the system **100** operates in real-time to process the incoming call in accordance with the user-specified criteria.

The Internet **134** may be conveniently used as a storage area for the caller specified criteria. The advantage of such data storage on the Internet is that the data is widely accessible to the user. This provides a convenient mechanism for entering new caller data or editing existing caller data. The user can access the affiliation list **150** with the user computer **154** via the network link **156**. In contrast, the central office switch **116** may access the affiliation list **150** via the communication link **132**, which may typically be a high-speed communication link. In addition, FIGS. **2**, **4**, and **5** illustrate the central office switch **116** as the telecommunication component that accesses the Internet **134**. It is convenient for operational efficiency to have the central office switch (e.g., the central office switch **116**) to which the destination telephone **104** is connected perform such Internet access. It is at this stage of the telephone call processing that the telecommunication system may most conveniently determine the user-specified caller status. However, those skilled in the art will recognize that the status check may be performed by other portions of the telecommunication system, such as the central office switch **106**, the LDC **124**, or the like. Thus, the present invention is not limited by the particular telecommunication component that establishes the communication link with a network which the user-specified caller status data is stored.

In addition, the system **100** can be readily implemented as an "add-on" component of the telecommunication system and need not be integrated with the central office switch **116**. For example, the conventional central office switch provides the ability to divert calls based on certain call conditions, such as "Call Forward No Answer," which may be used to divert an incoming call to voicemail or "Call Forward Busy," which may also divert the incoming call to voicemail. To implement the system **100** with an add-on processor, the system may optionally include a Switch to Computer Applications Interface (SCAI) **174** and a call filtering processor **176**. The dashed lines of FIG. **4** are intended to illustrate an alternative configuration of the system **100**. This alternative configuration can also be implemented with other telephone system configurations, such as illustrated in FIGS. **2** and **3**. The SCAI **174** is a telecommunication protocol that allows switches to communicate with external computers. Data, such as caller and callee telephone numbers, and status information, such as Call Forward Busy, are provided to the SCAI **174** by the central office switch **116**.

The call filtering processor **176** performs the functions described above to process the call in accordance with the user-specified criteria. That is, the call filtering processor **176** receives caller and callee data from the SCAI **174** and accesses the affiliation list **150** via the communication interface **136** (see FIG. **2**). The call filtering processor **176** uses user-specified call processing criteria to generate instructions for the central office switch **116**. The instructions are provided to the central office switch **116** via the SCAI **174**. Those skilled in the art will appreciate that the SCAI **174** is but one example of the Open Application Interface (OAI) that can be used with the central office switch **116**.

As noted above, the system **100** can process a call intended for the destination telephone **104**, block a call, or generate a busy signal at the originating telephone **102**. However, the system **100** also operates with voicemail and permits a number of different customized outgoing messages. FIG. **4** illustrates a voicemail system **180** having a storage area containing one or more outgoing messages **182**. For example, the voicemail system **180** can play an outgoing message **182** informing the caller that "the party you are calling only accepts calls from designated callers. Please leave a message." If calls are blocked only at certain times, the outgoing message **182** can say "the party you are calling does not accept calls between 11:30 a.m. and 1:00 p.m. Please leave a message or call back after 1:00 p.m." The outgoing message can also reflect callee availability by playing a message such as "The party you are calling is in a meeting. Please leave a message or call back in X minutes" where X reflects the amount of time before the meeting is expected to end. That information can be manually provided to the affiliation list **150** by the user or automatically derived from a computerized scheduling program on, by way of example, the user computer **154** (see FIG. **2**).

Computerized scheduling programs, such as Microsoft® Schedule Plus, can be used on the user computer **154** (see FIG. **2**). It is known that such scheduling programs can be accessed via a computer network or downloaded to a handheld computing device to track appointments. The system **100** can access such computerized scheduling programs and download appointments and scheduled meetings into the affiliation list **150**. The outgoing messages **182** can be automatically selected on the basis of the user's computerized schedule. Thus, the system **100** permits the user to schedule his day (e.g., meetings, lunch time, in office/available for calls, in office/unavailable for calls, etc.) on a computerized scheduling program and to process calls in accordance with the computerized schedule and even select outgoing messages automatically based on the user's schedule.

The operation of the system **100** is illustrated in the flowchart of FIG. **7**. At a start **200**, the calling party has placed a call from the originating telephone **102** (see FIG. **2**) to the destination telephone **104**. In step **202**, the central office switch **116** has received call data from the originating telephone **102**. The received call data includes the destination telephone number of the destination telephone **104** and identification data indicating the originating telephone **102** as the source of the present call. Use of automatic number identification (ANI) is a well-known technique for providing identification data indicating the originating telephone **102** as the source of the present call. While the specific implementation of ANI data, sometimes referred to as caller ID, may not be uniformly implemented throughout the United States, the ANI data is typically delivered between the first and second rings. In the present invention, the central office switch **116** (see FIG. **2**) does not initiate a ring signal to the destination telephone **104** until after determining the status of the calling party based on the ANI. In future implementations, telecommunication companies may transmit other forms of caller identification, such as caller name, Internet address, email alias, or the like. The system **100** operates satisfactorily with any form of caller identification. The only requirement for the system **100** is that some form of caller identification be provided. The call is processed in accordance with the user-specified criteria in the affiliation list **150** for the identified caller.

In step **204**, the central office switch **116** (see FIG. **2**) establishes the communication link **132** with the Internet **134**. Although step **204** illustrates the system **100** as actively establishing the communication link **132** with the Internet **134**, those skilled in the art will recognize that the system **100** can utilize a continuous high-speed data link between the central office switch and the Internet. Thus, it is not necessary to establish a network link for each and every incoming call processed by the central office switch **116**. As previously described, the communication interface **136** translates data between the telephone protocol and the Internet protocol. In step **206**, the system **100** accesses the affiliation list **150** for the user (i.e., the called party). In an exemplary embodiment, the telephone number of the destination telephone **104** or other callee identification is used as an index or pointer to a specific location within the database where the affiliation list **150** for the particular user may be found. Database operation in general, and techniques for locating specific items within a database in particular are known to those skilled in the art and need not be described herein.

In decision **210**, the system **100** determines whether the caller identification data is on the forward list **160** (see FIG. **3**). If the caller identification data is present in the forward list, the result of the decision **210** is YES. In that event, the system **100** proceeds to FIG. **7B** where the call is processed in accordance with the rules associated with the forward list **160**.

If the caller identification data is not present in the forward list **160** (see FIG. **3**), the result of decision **210** is NO. In that event, the system **100** moves to decision **212** to determine whether the caller identification data is in the allow list **166**. If the caller identification data is present in the allow list **166**, the result of decision **214** is YES. In that event, the system **100** proceeds to decision **216** where the

call is processed in accordance with the rules associated with the allow list **166**. If the caller identification data is not present in the allow list **166**, the result of decision **216** is NO.

In decision **218**, the system **100** determines whether the caller identification data is present in the reverse list **162**. If the caller identification data is present in the reverse list **162**, the system **100** proceeds to the step **220** where the call is processed in accordance with the rules associated with the reverse list **162**. If the caller identification data is not present in the reverse list, the result of decision **218** is NO. In that event, the system moves to decision **216** to determine whether the caller is present on the block list **164**. If the caller is present on the block list **164**, the result of decision **222** is YES. In that event, the system proceeds to step **224** where the call is processed in accordance with the rules associated with the block list. If the caller identification data is not present in the block list **164**, the result of decision **222** is NO. This indicates that the caller identification data is not present in any of the user-specified lists in the affiliation list **150**. In that event, the system moves to step **226** where the call may be processed in accordance with user-specified rules of processing anonymous or unidentified calls. The flowchart of FIG. **8** illustrates the operation of the system **100** with multiple lists wherein the call processing rules are designated for each list. In this embodiment, the call is processed on the basis of the presence or absence of the caller identification data in a particular list. However, as previously discussed, the affiliation list **150** (see FIG. **6B**) may include user-specified status criteria for individual callers. In this embodiment, the system **100** processes the call on the basis of the user-specified status criteria associated with the individual caller rather than on the basis of the caller's presence or absence in a specific list. In that event, the system **100** may simply access the user affiliation list (see step **206** in FIG. **7**) and process the call in accordance with the user-specified status criteria for the individual caller. If the caller identification data is not present in the affiliation list **160**, the call may be processed using user-specified call processing criteria for unidentified callers, as shown in step **226**.

Thus, the system **100** allows the user to specify call processing rules for a plurality of different caller lists or for individual callers within a list. The caller lists may be readily edited in accordance with the changing desires of the user. The user may alter the call processing rules in accordance with various times of day, work conditions, or even the personal mood of the user. For example, the user may process all calls during certain times of the day, such as when the user is at work. However, when the user arrives home, subsequent calls may be processed in accordance with a different set of rules, such as accepting no calls during dinner time or after a certain time at night.

These rules may be applied differentially to different ones of the list in the affiliation list **150**. For example, the user may accept calls from any calling party on the forward list **160** (see FIG. **3**) or the allow list **166** during the evening hours. However, after a certain time at night, the caller may accept calls only from calling parties on the forward list **160**. Thus, the system **100** allows great flexibility in the user selection of calling rules and lists. The system **100** allows the user to filter incoming calls in accordance with generalized rules or in accordance with highly specific rules.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. For example, the system discussed herein uses, by way of example, the Internet **134** to store the affiliation list **150**. However, the system **100** can be implemented with other computer networks or as a portion of a telephone switch, such as the central office switch **116**. The telephone service provider can provide a customer with an affiliation list and some means to control the list as a value-added telephone service. The central office switch **116** accesses the internal affiliation list and processes the incoming calls in accordance with the user-specified criteria contained therein. Accordingly, the invention is not limited except as by the appended claims.

What is claimed is:

1. In an environment where subscribers call a user over a telephone network, wherein a user telephone is coupled with the telephone network, a system for processing an incoming call from a subscriber to a user in the telephone network according to user specifications, the system comprising:

a data structure contained within a computer network to store user-selectable criteria for call processing, wherein the data structure stores the user-selectable criteria in one or more lists that are used in filtering an incoming call and wherein some of the one or more lists are used to filter the incoming call according to current activity of subscribers on the computer network or according to current activity of the user on the computer network;

a computer network access port used by the telephone network to access the data structure such that the telephone network has access to the one or more lists over the computer network access port; and

a controller to receive the incoming call designated for the user telephone and to process the incoming call in accordance with the user-selectable criteria, the controller accessing the user-selectable criteria in the one or more lists of the data structure via the computer network access port and thereby applying the user-selectable criteria to the incoming call.

2. The system of claim **1** wherein the data structure stores the user-selectable criteria in association with caller identification data and the incoming call includes origination identification data associated therewith, the controller using the origination identification data to identify user-selectable criteria stored in the data structure in association with the caller identification data.

3. The system of claim **2** wherein the identification data is telephone automatic number identification data.

4. The system of claim **2** wherein the identification data is electronic mail identification data.

5. The system of claim **1** wherein the user-selectable criteria indicates permission to process the incoming call, the controller processing the incoming call in accordance with the permission to generate a ring signal at the user telephone.

6. The system of claim **1** wherein the user-selectable criteria indicates no permission to process the incoming call, the controller blocking the incoming call and not generating a ring signal at the user telephone.

7. The system of claim **6** wherein the controller blocking the incoming call generates a busy signal at an origination telephone from which the incoming call is originated.

8. The system of claim **6**, further comprising an outgoing message system having an outgoing message, the controller blocking the incoming call and playing the outgoing message at an origination telephone.

9. The system of claim **1** wherein the user-selectable criteria indicates permission to process the incoming call during a user-selected time period, the controller processing

the incoming call during the user-selected time period in accordance with the permission to generate a ring signal at the user telephone, the controller blocking the incoming call and not generating a ring signal at the user telephone during a time period other than the user-selected time period.

10. The system of claim **9**, further comprising an outgoing message system storing a plurality of outgoing messages, the controller selecting one of the plurality of outgoing messages wherein the outgoing message system plays the selected outgoing message at an origination telephone from which the incoming call is originated.

11. The system of claim **10** wherein the incoming call arrives at a particular time other than the user-selected time period, the controller selecting the selected outgoing message based on the particular time of arrival of the incoming call.

12. The system of claim **1**, further comprising a data editor to permit user entry and editing of the user-selectable criteria into the data structure.

13. The system of claim **12** wherein the data editor is a computer coupled to the computer network.

14. The system of claim **1** wherein the computer network is the Internet.

15. The system of claim **1** wherein each of the one or more lists of the data structure comprises a plurality of data substructures each storing caller identification data and having the user-selectable criteria associated with each of the plurality of data substructures, wherein the incoming call includes origination identification data associated therewith, the controller using the origination identification data to determine a particular one of the plurality of data substructures storing caller identification data corresponding to the origination identification data and processing the incoming call in accordance with the user-selectable criteria associated with the particular one of the plurality of data substructures.

16. The system of claim **15**, further comprising a data editor to permit user entry of the caller identification data into the data structure prior to receipt of the incoming call.

17. The system of claim **15** wherein a first of the plurality of data substructures is a list of caller identification data to identify individuals from whom the user will accept incoming calls, the controller processing the incoming call and signaling the user telephone of an incoming call directed to the user telephone if the origination identification data corresponds to caller identification data in the first of the plurality of data substructures.

18. The system of claim **15** wherein a first of the plurality of data substructures is a list of caller identification data to identify individuals from whom the user will not accept incoming calls, the controller blocking processing of the incoming call if the origination identification data corresponds to caller identification data in the first of the plurality of data substructures.

19. The system of claim **18** wherein the controller blocking processing of the incoming call generates a busy signal at an origination telephone from which the incoming call is originated.

20. The system of claim **15** wherein a first of the plurality of data substructures is a list of caller identification data to identify individuals from whom the user will accept incoming calls subject to user-selected time restrictions, the controller processing the incoming call in accordance with the time restrictions and signaling the user telephone of an incoming call directed to the user telephone if the origination identification data corresponds to caller identification in the first of the plurality of data substructures.

21. In an environment where subscribers call a user over a telephone network, wherein a user telephone is coupled with the telephone network, a system for user specification of call processing in the telephone network, the system comprising:

a data structure contained within a computer network and accessible by the telephone network, the data structure containing a plurality of caller lists each having associated user-selectable criteria for call processing, wherein some of the plurality of caller lists are conditioned according to current activity of subscribers on the computer network or according to current activity of the user on the computer network;

a computer network access port used by the telephone network to access the data structure such that the telephone network has access to the plurality of caller lists; and

a controller on the telephone network to receive an incoming call having origination data indicative of a subscriber and destination data indicating the call is designated for the user telephone, the controller accessing the plurality of caller lists in the data structure via the computer network access port to determine which of the plurality of caller lists contains the origination data, the controller processing the incoming call in accordance with the user-selectable criteria associated with the caller list containing the origination data.

22. The system of claim **21** wherein the user-selectable criteria associated with the caller list containing the origination data indicates permission to process the incoming call, the controller processing the incoming call in accordance with the permission to generate a ring signal at the user telephone.

23. The system of claim **21** wherein the user-selectable criteria associated with the caller list containing the origination data indicates no permission to process the incoming call, the controller blocking the incoming call and not generating a ring signal at the user telephone.

24. The system of claim **21** wherein the user-selectable criteria associated with the caller list containing the origination data indicates permission to process the incoming call during a user-selected time period, the controller processing the incoming call during the user-selected time period in accordance with the permission to generate a ring signal at the user telephone, the controller blocking the incoming call and not generating a ring signal at the user telephone during time periods other than the user-selected time period.

25. The system of claim **21**, further comprising a data editor to permit user entry and editing of the user-selectable criteria into the data structure.

26. The system of claim **21** wherein the computer network is the Internet.

27. The system of claim **21** wherein the telephone network is a public switched telephone network.

28. In a system where subscribers call a user over a telephone network, wherein a user telephone is coupled with the telephone network, a computer program product for implementing a method for processing a call from a subscriber to a user over a telephone network, the computer program product comprising:

a computer readable medium having computer executable instructions for performing the method, the method comprising:

accepting an incoming call designated for the user telephone;

accessing a data structure contained within a computer network that is independent of the telephone network to retrieve user-selectable criteria for call processing stored within the data structure, wherein some of the

user-selectable criteria is conditioned on current activity of subscribers on the computer network or according to current activity of the user on the computer network; and

processing the incoming call in accordance with the user-selectable criteria.

29. The computer program product of claim 28, further comprising:

generating call processing rules based on the user-selectable criteria; and

storing the call processing rules on the computer network in association with a caller list.

30. The computer program product of claim 29 wherein generating call processing rules is performed on a computer coupled to the computer network.

31. The computer program product of claim 28 wherein the data structures store the user-selectable criteria in association with caller identification data and the incoming call includes origination identification data associated therewith, the method further comprising accessing the data structure using the origination identification data to identify user-selectable criteria stored in the data structure in association with the caller identification data.

32. The computer program product of claim 28 wherein the user-selectable criteria indicates permission to process the incoming call, the method comprising:

processing the incoming call comprising establishing a link with the user telephone; and

generating a ring signal at the user telephone.

33. The computer program product of claim 28 wherein the user-selectable criteria indicates no permission to process the incoming call, the method further comprising

processing the incoming call comprising blocking the incoming call; and

not generating a ring signal at the user telephone.

34. The computer program product of claim 33, further comprising generating a busy signal at an origination telephone from which the incoming call is originated.

35. The computer program product of claim 34, further comprising playing an outgoing message at an origination telephone from which the incoming call is originated, the outgoing message indicating that the incoming call will not be connected to the user telephone.

36. The computer program product of claim 28 wherein the user-selectable criteria indicates permission to process the incoming call during a user-selected time period, the method further comprising:

processing the incoming call during the user-selected time period in accordance with the permission to generate a ring signal at the user telephone; and

blocking the incoming call and not generating a ring signal at the user telephone during time periods other than the user-selected time period.

37. The computer program product of claim 28 wherein the data structure comprises a plurality of data substructures each storing caller identification data and having the user-selectable criteria associated with each of the plurality of data substructures, wherein the incoming call includes origination identification data associated therewith, the method further comprising:

accessing the data structure using the origination identification data to determine a particular one of the plurality of data substructures storing caller identification data corresponding to the origination identification data; and

processing the incoming call in accordance with the user-selectable criteria associated with the particular one of the plurality of data substructures.

38. In a system including a telephone network and a computer network where an originating telephone connects with a user telephone over the telephone network, a method for processing a call from the originating telephone to the user telephone according to user specifications, the method comprising:

accepting an incoming call designated for the user telephone from an originating telephone of a subscriber;

accessing a data structure contained within a computer network that is independent of the telephone network to retrieve user-selectable criteria for call processing stored within the data structure, wherein some of the user-selectable criteria is conditioned on current activity of subscribers on the computer network or according to current activity of the user on the computer network; and

processing the incoming call of the subscriber in accordance with the user-selectable criteria.

39. The method of claim 38, further comprising generating call processing rules based on the user-selectable criteria and storing the call processing rules on the computer network in association with a caller list that is associated with the data structure.

40. The method of claim 39 wherein generating call processing rules is performed on a computer coupled to the computer network.

41. The method of claim 38 wherein the computer network is the Internet.

42. The method of claim 38 wherein the telephone network is a public switched telephone network.

43. The method of claim 38 wherein the data structure stores the user-selectable criteria in association with caller identification data and the incoming call includes origination identification data associated therewith, wherein accessing a data structure further comprises using the origination identification data to identify user-selectable criteria stored in the data structure in association with the caller identification data.

44. The method of claim 38 wherein the user-selectable criteria indicates permission to process the incoming call, wherein processing the incoming call further comprises establishing a link with the user telephone and generating a ring signal at the user telephone.

45. The method of claim 38 wherein the user-selectable criteria indicates no permission to process the incoming call, wherein processing the incoming call further comprises blocking the incoming call and not generating a ring signal at the user telephone.

46. The method of claim 45, further comprising generating a busy signal at an origination telephone from which the incoming call is originated.

47. The method of claim 45, further comprising playing an outgoing message at an origination telephone from which the incoming call is originated, the outgoing message indicating that the incoming call will not be connected to the user telephone.

48. The method of claim 38 wherein the user-selectable criteria indicates permission to process the incoming call during a user-selected time period, wherein processing the incoming call further comprises:

processing the incoming call during the user-selected time period in accordance with the permission to generate a ring signal at the user telephone;

blocking the incoming call; and

not generating a ring signal at the user telephone during time periods other than the user-selected time period.

49. The method of claim 38 wherein the data structure comprises a plurality of data substructures each storing caller identification and having the user-selectable criteria associated with each of the plurality of data substructures, wherein the incoming call includes origination identification data associated therewith, wherein accessing the data structure further comprises using the origination identification data to determine a particular one of the plurality of data substructures storing caller identification data corresponding to the origination identification data and processing the incoming call in accordance with the user-selectable criteria associated with the particular one of the plurality of data substructures.

50. The method of claim 49 wherein a first of the plurality of data substructures is a list of caller identification data to identify individuals from whom the user will accept incoming calls, wherein processing the incoming call further comprises signaling the user telephone of an incoming call directed to the user telephone if the origination identification data corresponds to caller identification in the first of the plurality of data substructures.

51. The method of claim 49 wherein a first of the plurality of data substructures is a list of caller identification data to identify individuals from whom the user will not accept incoming calls, wherein processing the incoming call further comprises not establishing a communication link with the user telephone if the origination identification data corresponds to caller identification in the first of the plurality of data substructures.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,421,439 B1
DATED : July 16, 2002
INVENTOR(S) : Stephen Mitchell Liffick

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1,
Line 37, after "need for" please insert -- a --

Column 3,
Line 61, before "and the like" please delete "(ROM)," and insert -- (ROMs), --

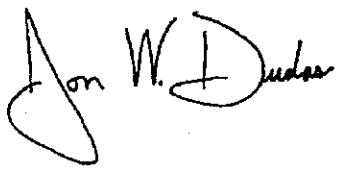
Column 5,
Line 3, after "In" please delete "true" and insert -- turn --

Column 10,
Line 28, after "such as" please delete "an" and insert -- a --

Column 17,
Line 31, after "method further comprising" please insert -- : --

Signed and Sealed this

Sixth Day of April, 2004



JON W. DUDAS
Acting Director of the United States Patent and Trademark Office

EXHIBIT 5

ITC Claim Constructions: '439 Patent			
Term	**Asserted Delaware Claims Containing Construed Term**	**Microsoft-ALE Joint Construction[1]**	**ALJ's Construction[2]**
"telephone network"	Claims 1, 21, 28 and 38	"network for carrying telephony information"	N/A
"computer network"	Claims 1, 23, 28 and 38	"network for carrying digital data"	N/A
"current activity of the user on the computer network"[3]	Claims 1, 21, 28 and 38	"current status of the user on the computer network"	The ALJ further construed "status" to "consist of both user-selected indicators based on user activity (e.g., 'conditional processing' as per the '439 specification) and the transfer of data-between the computer and telephone networks while the user is engaged in a VoIP phone call"
"the controller accessing the user-selectable criteria in the one or more lists of the data structure via the computer network access port"	Claim 1	"hardware or software that accesses the user-selectable criteria in one or more lists of the data structure via the computer network access port and thereby applying the user-selectable criteria to the incoming call"	N/A
"accessing a data structure contained within a computer	Claims 28 and 38	N/A	"accessing a data structure in the computer network that

[1] ITC Order No. 18: Initial Determination Terminating The Investigation As To Claims 3 and 48 Of The '439 Patent, Claims 3, 6, And 8-10 Of The '289 Patent, Claim 9 Of The '064 Patent And Claim 4 Of The '357 Patent

[2] Final Initial and Recommended Determinations by the ALJ

[3] The International Trade Commission is currently reviewing the ALJ's construction of "current activity of the user on the computer network."

network that is independent of the telephone network"			is physically separate from the telephone network"
"current status"[4]	Agreed-upon construction for "current activity of the user on the computer network" in Claims 1, 21, 28 and 38	N/A	The ALJ further construed "current status" as "the status of a user or subscriber at the present time or the most recent status of a user or subscriber"

[4] The International Trade Commission is currently reviewing the ALJ's construction of "current."

ITC Claim Constructions: '289 Patent			
Term	**Asserted Delaware Claims Containing Construed Term**	**Microsoft-ALE Joint Construction[5]**	**ALJ's Construction[6]**
"telephone network"	Claims 1, 3, 7 and 8	"network for carrying telephony information"	N/A
"computer network"	Claims 1, 3, 7 and 8	"network for carrying digital data"	N/A
"monitoring activity of a user computer connected to the computer network"	Claims 1 and 7	N/A	"determining whether the user computer is active or idle"

[5] ITC Order No. 18: Initial Determination Terminating The Investigation As To Claims 3 and 48 Of The '439 Patent, Claims 3, 6, And 8-10 Of The '289 Patent, Claim 9 Of The '064 Patent And Claim 4 Of The '357 Patent

[6] Final Initial and Recommended Determinations by the ALJ

ITC Claim Constructions: '064 and '357 Patents			
Term	**Asserted Delaware Claims Containing Construed Term**	**Microsoft-ALE Agreed-Upon Construction[7]**	**ALJ's Construction[8]**
"communication options"	'064 Claims 1, 3 and 20 '357 Claims 1, 6 and 17	"parameters associated with specific types of communication services"	N/A
"unified messaging system"	'064 Claims 1 and 20 '357 Claims 1 and 17	"system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages"	N/A
"telephony-centric network"	'064 Claims 1, 11 and 20 '357 Claims 1 and 17	"a network that carries telephony information used by devices such as telephones, pagers, facsimile machines, and voice mail boxes"	N/A
"data-centric network"	'064 Claims 1 and 20 '357 Claims 1 and 17	"a network, that carries digital data, primarily to facilitate information exchange among computers and computer peripherals"	N/A
"e-mail service"	'064 Claim 11	"a communication service for receiving,	N/A

[7] ITC Order No. 18: Initial Determination Terminating The Investigation As To Claims 3 and 48 Of The '439 Patent, Claims 3, 6, And 8-10 Of The '289 Patent, Claim 9 Of The '064 Patent And Claim 4 Of The '357 Patent

[8] Final Initial and Recommended Determinations by the ALJ

	'357 Claims 1 and 17	storing, retrieving, and forwarding e-mails"	
"voice telephone service"	'064 Claim 11 '357 Claims 1 and 17	"a communication service for receiving, storing, retrieving, and forwarding telephony information"	N/A
"generate [or generating] a single graphical menu for displaying said communication options for each of said communication services at the same time"	'064 Claims 1 and 20 '357 Claim 1	N/A	"generate, or generating, one graphical menu for displaying all of the communication options for all of the plurality of communication services"
"said telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access the computer-implemented control center"	'064 Claims 1 and 20	N/A	"the telephony server being configured to audibly represent communication options pertaining to at least two communication services to a telephone when the subscriber employs said telephone to access the computer implemented control center"
"audibly representing said communication options to one of said telephones, using said telephony server, when said subscriber employs one of said telephones to access said computer-implemented control center"	'357 Claim 1	N/A	"audibly representing communication options pertaining to at least two communication services to a telephone, using said telephony server, when a subscriber employs one of the telephones to access the computer-implemented control center"

EXHIBIT 6

UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

MICROSOFT CORP., Plaintiff, v. ALCATEL-LUCENT ENTERPRISE and GENESYS TELECOMMUNICATIONS LABORATORIES, INC., Defendants.	Civil Action No. 07-090-SLR Hon. Sue L. Robinson Jury Trial Demanded

JOINT CLAIM CHART

Per the Court's scheduling order, the parties submit the following joint claim chart outlining the terms for which there is a claim construction dispute. At issue are three terms in the '439 patent, four in the '289 patent, and seven in the '357 and '064 patents. For convenience, those terms, as well as the parties' proposed constructions, appear below.

'439 patent			
Term	**Appears In**	**MS Proposed Constr.**	**Defs.' Proposed Constr.**
"telephone network"	All asserted claims	"network for carrying telephony information"	"network for carrying telephony information originated by telephones"
"computer network"	All asserted claims	"network for carrying digital data"	"network for carrying digital data originated by computers"
"current activity of subscribers on the computer network or according to current activity of the user on the computer network"	All asserted claims	"current status of subscribers on the computer network or according to current status of the user on the computer network"	"whether the calling party is present on the computer network or the called party is present on the computer network"
"the controller accessing the user-selectable criteria in the one or more lists of the data structure via the computer network access port and thereby applying the user-selectable criteria to the incoming call"	Claims 1, 2 and 9	*The parties agree to the following construction:* "hardware or software that accesses the user-selectable criteria in the one or more lists of the data structure via the computer network access port and thereby applying the user-selectable criteria to the incoming call"	

'289 patent			
Term	**Appears In**	**MS Proposed Constr.**	**Defs.' Proposed Constr.**
"telephone network"	All asserted claims	"network for carrying telephony information"	"network for carrying telephony information originated by telephones"
"computer network"	All asserted claims	"network for carrying digital data"	"network for carrying digital data originated by computers"
"monitoring activity of a user computer"	All asserted claims	*Phrase does not require construction.* *If construction is required:* "monitoring the status of a user computer"	"determining whether a called party's computer is active or idle"
"at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party"	All asserted claims	*Phrase does not require construction.* *If construction is required:* "receiving at the computer network information from the telephone network that a telephone call from a first party to a second party has been initiated"	"receiving at the computer network an indication from the telephone network that a first party requests to set up a telephone call with a second party prior to the time the call is placed by the first party"

'064 and '357 patents			
Term	**Appears In**	**MS Proposed Constr.**	**Defs.' Proposed Constr.**
"unified messaging system"	All asserted claims	"system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (*i.e.*, in a coordinated manner)	"system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded to the communication devices or networks employed for the transmission of the messages"
"communication options"	All asserted claims	"settings that control how communication services will be handled"	"parameters associated with specific types of communication services"
"[first/second] enable option for enabling or disabling the [first/second] communication service"	Claims 1, 3, 8, 9 and 11 of the '064 patent; claims 1, 6 and 17 of the '357 patent	"communication option that controls the extent to which a communication service is implemented"	"an option that allows a subscriber to turn on or off a communication service"
"a single graphical menu for displaying said communication options for each of said communication services at the same time"	All asserted claims	"a single graphical menu for displaying at least a first communication service and option and a second communication service and option at the same time"	"one graphical menu that shows all of the communication options associated with the subscriber's communication services"
"audibly representing said communication options to one of said telephones using said telephony server, when said subscriber employs said one of said telephones	Claim 1 of the '357 patent;	"audibly representing communication options pertaining to at least two communication services to a telephone using said telephony server, when a subscriber employs one of the telephones to access the computer-implemented control center"	"audibly representing the same options available through the graphical menu to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center"

'064 and '357 patents			
Term	**Appears In**	**MS Proposed Constr.**	**Defs.' Proposed Constr.**
to access said computer-implemented control center"			
"an audible representation of said communication options capable of being provided to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center"	Claim 17 of the '357 patent	"an audible representation of communication options pertaining to at least two communication services capable of being provided to one of the telephones, using said telephony server, when a subscriber employs one of the telephones to access the computer-implemented control center"	"an audible representation of the same options available through the graphical menu to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center"
"telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center"	All asserted claims of the '064 patent	"telephony server being configured to audibly represent communication options pertaining to at least two communication services to a telephone when the subscriber employs said telephone to access the computer-implemented control center"	"a telephony server that represents the same communication options that are available through the single graphical menu"

Dated: May 2, 2008

Respectfully submitted,

MICROSOFT CORPORATION

By its attorneys,

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By their attorneys,

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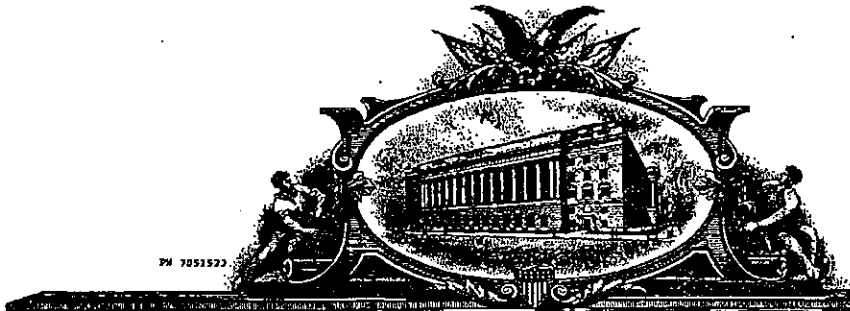
EXHIBIT 7



PM 7851523

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

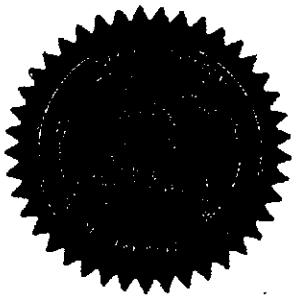
March 05, 2007

THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS OF:

APPLICATION NUMBER: *09/239,585*
FILING DATE: *January 29, 1999*
PATENT NUMBER: *6,263,064*
ISSUE DATE: *July 17, 2001*

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

W. MONTGOMERY
Certifying Officer



MSAL 00761

What is claimed is:

1. A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber;

a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to visually display said communication options on one of said display terminals when said subscriber employs said one of said display terminals to access said computer-implemented control center, said computer server also being configured to receive from said subscriber via said one of said display terminals a first change to said communication options and to update said first change to said account in said subscriber communication profile database; and

a telephony server coupled to exchange data with said communication profile database, said telephony server being configured to audibly represent said communication options to one of said telephones when said subscriber employs said one of said telephones to access said computer-implemented control center, said telephony server also being configured to receive from said subscriber via said one of said telephones a second change to said communication options and to update said

second change to said account in said subscriber communication profile database.

2. The computer-implemented control center of claim 1 wherein said plurality of communication services include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephony-centric network and said telephony server, said communication options including a facsimile receiving enable option associated with said facsimile service.

3. The computer-implemented control center as recited in claims 12 wherein said facsimile and said voice telephone service are both implemented using a single telephone number.

4. The computer-implemented control center of claim 1 further comprising:

a pager server coupled to exchange data with said communication profile database, wherein said communication services further include a pager alert service and wherein said communication options further include a pager alert option, said pager server being configured to transmit, when said pager alert option is enabled, an alert to a pager through said telephony-centric network if an e-mail message is received by said subscriber through said data-centric network, said pager having a page number that is also specified as part of said pager alert option.

5. The computer-implemented control center of claim 1 wherein said plurality of communication services include a call forwarding service configured to permit said subscriber to specify whether a call received at a telephone number associated with said account be forwarded to a forwarding telephone number, said communication options including a call forwarding enable option and said forwarding telephone number.

6. The computer-implemented control center of claim 1 wherein said plurality of communication services include a follow me service, said communication options including a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers.

7. The computer-implemented control center of claim 6 wherein said follow me service is configured to ring in sequence each one of telephones associated said set of telephone numbers until said call by said caller is accepted.

8. The computer-implemented control center of claim 7 wherein said follow-me service is configured to ring first a last-found telephone number, said last-found telephone number representing a telephone number associated with a phone previously employed by said subscriber to answer an immediately preceding call to said subscriber.

9. The computer-implemented control center of claim 1 wherein said plurality of communication services include an alternate number service, said communication options including an alternate number service enable option associated with said alternate number service and an alternate telephone number, said alternate number service enable option, when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to an alternate telephone associated with said alternate telephone number.

10. A computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said method comprising:

providing a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber;

visually displaying said communication options on one of said display terminals, using a computer server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computer-implemented control center;

receiving from said subscriber via said one of said display terminals at said computer server a first change to said communication options, said first change to said communication options pertains to either said voice telephone service or said e-mail service;

updating said first change to said account in said subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

11. The computer-implemented method of claim 10 further including:

providing a telephony server coupled to exchange data with said communication profile database;

audibly representing said communication options to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center;

receiving at said telephony server from said subscriber via said one of said telephones a second change to said communication options; and

updating said second change to said account in said subscriber communication profile database, thereby resulting in a second updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said e-mail service are handled in accordance with said second updated subscriber communication profile database.

12. The computer-implemented method of claim 10 wherein said plurality of communication services include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephony-centric network and said telephony server, said communication options including a facsimile receiving enable option associated with said facsimile service.

13. The computer-implemented control center as recited in claims 11 wherein said facsimile and said voice telephone service are both implemented using a single telephone number.

14. The computer-implemented method of claim 10 further comprising:

providing a pager server coupled to exchange data with said communication

profile database, wherein said communication services further include a pager alert service and wherein said communication options further include a pager alert option, said pager server being configured to transmit, when said pager alert option is enabled, an alert to a pager through said telephony-centric network if an e-mail message is received by said subscriber through said data-centric network, said pager having a page number that is also specified as part of said pager alert option.

15. The computer-implemented method of claim 10 wherein said plurality of communication services include a call forwarding service configured to permit said subscriber to specify whether a call received at a telephone number associated with said account be forwarded to a forwarding telephone number, said communication options including a call forwarding enable option and said forwarding telephone number.

16. The computer-implemented method of claim 10 wherein said plurality of communication services include a follow me service, said communication options including a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers.

17. The computer-implemented method of claim 16 wherein said follow me service is configured to ring in sequence each one of telephones associated said set of telephone numbers until said call by said caller is accepted.

18. The computer-implemented method of claim 17 wherein said follow-me service is configured to ring first a last-found telephone number, said last-found

telephone number representing a telephone number associated with a phone previously employed by said subscriber to answer an immediately preceding call to said subscriber.

19. The computer-implemented method of claim 10 wherein said plurality of communication services include an alternate number service, said communication options including an alternate number service enable option associated with said alternate number service and an alternate telephone number, said alternate number service enable option, when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to an alternate telephone associated with said alternate telephone number.

20. A computer-implemented method for permitting a subscriber of a unified messaging system to customize communication options pertaining to a plurality of communication services of said unified messaging system, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service and an e-mail service, said communication options being accessible via display terminals coupled to a data-centric network and via telephones coupled to a telephony-centric network, said computer-implemented method comprising:

receiving, via either a first display terminal of said display terminals or a first telephone of said telephones, a request to access an account pertaining to said subscriber;

obtaining from a subscriber communication profile database said communication options for said subscriber in said account;

presenting said communication options for said subscriber on a respective one of said first display terminal and said first telephone from which said request to access is received;

receiving communication setting edits from said subscriber through said respective one of said first display terminal and said first telephone from which said request to access is received, said communication setting edits pertaining to said communication options; and

modifying said communication options in accordance with said communication setting edits, wherein said communication services are subsequently controlled in accordance with said communication options after said modifying.

21. The computer-implemented method of claim 20 wherein said plurality of communication services include a call forwarding service, said receiving said communication edits includes receiving at least one of a call forwarding enable option associated with said call forwarding service and a forwarding telephone number associated with said call forwarding service, said call forwarding enable option, when enabled by said subscriber, forwards calls destined for said subscriber at said unified messaging system to said forwarding telephone number, and wherein said modifying said communication options includes modifying a setting associated with said forwarding service in accordance with said at least one of said call forwarding enable option and said forwarding telephone number.

22. The computer-implemented method of claim 20 wherein said plurality of communication services include a follow-me service, said receiving said communication edits includes receiving, as one of said communication setting edits, at least one of a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers, and wherein said modifying said communication options includes modifying a setting associated with said follow-me service in accordance with said at least one of said follow-me service enable option and said set of telephone numbers.

CENTRALIZED COMMUNICATION CONTROL CENTER AND METHODS THEREFOR

Abstract of the Disclosure

A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options is accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The computer-implemented control center includes a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber. There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on one of the display terminals when the subscriber employs the one of the display terminals to access the computer-implemented control center. The computer server also is configured to receive from the subscriber via the one of the display terminals a first change to the communication options and to update the first change to the account in the subscriber communication profile database. There is further included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to one of the telephones when the subscriber employs the one of the telephones to access the computer-implemented control center. The telephony server also is configured to receive from the subscriber via the one of the telephones a second change to the

communication options and to update the second change to the account in the subscriber communication profile database.

09022010-0556E260

Office Action Summary	Application No. 09/239,585	Applicant(s) O'NEAL ET AL	
	Examiner Roland G. Foster	Art Unit 2748	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

1)☒ Responsive to communication(s) filed on *29 January 1999* .

2a)☐ This action is FINAL. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some * c)☐ None of the CERTIFIED copies of the priority documents have been:

1.☐ received.

2.☐ received in Application No. (Series Code / Serial Number) _____ .

3.☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

14) ☒ Notice of References Cited (PTO-892)
15) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
16) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
17) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
18) ☐ Notice of Informal Patent Application (PTO-152)
19) ☐ Other:

Specification

The abstract of the disclosure is objected to because the abstract appears to be over 250 words in length. Correction is required. See MPEP § 608.01(b).

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Unified Messaging System with an Audibly and Visually Updateable Subscriber Communication Profile Database.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 9-13, 15, and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Pepe et al. (U.S. Patent No. 5,742,905) (Hereinafter Pepe).

With respect to claim 1, Pepe discloses all within the claim. A unified messaging computer center (Fig. 3, Service Provider 40, col. 3, lines 45-58, and col. 4, line 29 – col. 5, line 23) that permits subscribers to customize communication options pertaining

to the unified messaging service including routing (Figures 28-45). The unified messaging system comprises a telephony-centric voice telephone service (Fig. 3, PSTN 10) and data-centric e-mail service (Fig. 21 and col. 24, lines 54-67). A subscriber communication profile having a subscriber account including communication options reads on the abstract and col. 33, lines 1-3.

Pepe also discloses a subscriber may change subscriber communication profile database options audibly (col. 11, lines 14-32 and col. 13, lines 35-67) and visually (Figures 28-45 and col. 12, line 65 – col. 13, line 25). The "computer server" reads on PCI Applications Server (114) (col. 8, lines 62-67) and the "telephony server" reads on IP Function Server (130) (col. 9, lines 34-35). See also col. 9, lines 42-45.

Claims 10, 11, an 20 differ from claim 1 in that the claims are directed to a method which reads on the passages of Pepe cited in claim 1. Therefore, see the claim 1 rejection for further details.

With respect to claims 2 and 12, "communication services include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephone-centric network and said telephony server...options including...enable option.." reads on Fig. 23, Fig. 33, and col. 5, lines 1-5.

With respect to claims 3 and 13, "said facsimile and said voice telephone service are both implemented using a single telephone number" reads on col. 5, lines 59-62.

With respect to claims 5, 15, and 21, "communication services include a call forwarding service configured to permit said subscriber to specify whether a call received at a telephone number associated with said account be forwarded to a forwarding telephone number...options including...enable option and said forwarding telephone number" reads on Fig. 43 and Fig. 44.

Claims 9 and 19 appear to contain no limitations functionally different from the call forwarding arrangement of Pepe that required an alternate number and read upon the limitations of claim 5. See the claim 5 rejection for further details.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pepe as applied to claims 1, 10, and 11 above. "Pager alert services and...pager alert options...if an e-mail message is received by said subscriber" reads on Fig. 35, col. 5, lines 60-67, and col. 35, lines 18-19. Specifying a pager number as part of the pager alert option would be an obvious design choice similar to how Pepe discloses how the subscriber enters a fax number for the fax alert option (Fig. 34).

Claims 6, 7, 16, 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pepe as applied to claims 1, 10 and 20 above, and further in view of *Feit et al. (U.S. Patent No. 5,430,791) (Hereinafter Feit).*

Pepe does disclose a "follow-me" service.

However, Feit teaches of a follow-me service that includes an enable option (col. 5, lines 30-31), a set of sequenced (claim 7) telephone numbers (col. 8, Table 2 and col. 3, Table 3). Note that a voice mail system answering after a sequence of calls (col. 11, lines 12-15) would be "accepting" a call.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to the follow-me service option as taught by Feit to the unified messaging system disclosed by Pepe.

The suggestion/motivation for doing so is that follow-me services are often associated with voice mail services (Feit, abstract and Table 1). Likewise, the unified messaging of Pepe serves as a voice mail system (col. 5, lines 59-62). Additionally, both Pepe and Feit are directed very specifically to personal communication systems (Pepe, col. 3, line 45 and Feit, col. 1, lines 13-15) suggesting that the designer of a personal communication system would have been aware of both the concept and advantages of a follow-me service. Finally, a follow-me service would have increase the user-friendliness of a personal communication system (col. 1, lines 25-33).

Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pepe in view of Feit as applied to claims 1, 6, 7, 10, 16, and 17 above, and further in view of Bissell et al. (U.S. Patent No. 5,243,645) (Hereinafter Bissell).

Pepe does not disclose, but Bissel teaches of a follow-me service that rings the last-found telephone number associated with a phone previously employed by the subscriber (abstract and col. 4, lines 27-32). It would have been obvious that the

telephone the subscriber just used to make a call could have also been used to answer a call.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to add routing to the last-found number as taught by Bissell to the unified messaging system with follow-me routing as disclosed by Pepe in view of Feit.

The suggestion/motivation for doing so would have been user-friendliness and efficiency by not requiring the subscriber to continuously update forwarding information while the subscriber is travelling (Bissell, col. 1, lines 59-63 and col. 2, lines 36-49).

Please **REPLACE** the original **Abstract of the Disclosure** with the following:

--A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal is disclosed. The computer implemented control center includes a subscriber communication profile database having therein an account pertaining to the subscriber. The account includes the communication options for the subscriber. The communication options include parameters associated with individual ones of the communication services and routings among the communication services. There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on the display terminal when the subscriber employs the display terminal to access the computer-implemented control center through the data-centric network. The computer server is also configured to receive from the subscriber via the display terminal a first change to the communication options and to update the first change to the account in the subscriber communication profile database. There is also included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to the telephone when the subscriber employs the telephone to access the computer-implemented control center. The telephony server is also configured to receive from the subscriber via the telephone a second change to the communication options and to update the second change to the account in the subscriber communication profile database.--

In the Claims

Please **AMEND** claims 1, 2, 10, 11, 16, 17 and 20 as follows:

1. (Once Amended) A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services **through either a telephony-centric network using a telephone or a data-centric network using a display terminal, [said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication**

services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network,] said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, **said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services;**

a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to **generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to** visually display said **single graphical menu** [communication options] on **[one of]** said display terminal**[s]** when said subscriber employs **[said one of]** said display terminal**[s]** to access said computer-implemented control center **through said data-centric network**, said computer server also being configured to receive from said subscriber via said **[one of said]** display terminal**[s]** **and said data-centric network** a first change to said communication options and to update said first change to said account in said subscriber communication profile database; and

a telephony server coupled to exchange data with said communication profile database, said telephony server being configured to audibly represent said communication options to **[one of]** said telephone**[s]** when said subscriber employs **[said one]** said telephone**[s]** to access said computer-implemented control center, said telephony server also being configured to receive from said subscriber via **[said one of]** said telephone**[s]** a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

2. The computer-implemented control center of claim **[1]** 28 wherein said plurality of communication services include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephony-centric network and

Three listings are included in the method: 1) associating a telephone number to a tag, 2) storing tags in a quick sequence and 3) activating a quick response (Col 3-5). The listings show the portion of interaction after the subscriber places a call to an 800-type telephone number to connect to the automated attendant and after he/she has successfully completed any login procedures to begin administering his/her personal telephone number. In the third listing, Feit states, "To turn a quick sequence or quick follow me destination on or off, press 2 (Col. 5, lines 30-31)."

Bissel discloses a method of forwarding telecommunication calls to individuals when they are away from their normal location. More particularly, a telecommunication subscriber who is traveling away from his or her home or office can have calls forwarded to a different location that is determined automatically when the subscriber engages in a transaction or activity that indicates his/her location. The transaction or activity can be any action that causes an electronic database to be updated with information that directly or indirectly is indicative of the subscriber's whereabouts, either specific or general. It is not necessary for the subscriber for the subscriber to remember to specifically to update his/her database record.

Claims 1-9 and 20-30

In contrast to Pepe, independent claims 1 and 20 of the present application require a **single graphical menu** that is arranged to display the communication options for each of the communication services **at the same time**. That is, the communication options for each of the communication services are simultaneously displayed on a computer terminal when the subscriber employs the display terminal to access the computer-implemented control center through a data-centric network. In essence, the graphical menu serves as a centralized visual interface or control panel for reviewing and/or customizing the communication options associated with various communication services. As should be appreciated, by providing a single graphical menu, a user may quickly and conveniently review the communication options and make changes thereto. Claims 1 and 20 have been amended to better clarify this aspect of the invention.

While Pepe may disclose the use of control options and subscriber profiles, Pepe does not contemplate a single graphical menu where only one view is used to display the communication options. Rather, in Pepe, the subscriber must go through a plurality of views independently,

wherein the options are displayed at different times (See, Col. 34, Line 10 – Col. 36, Line 51 and Figures 28-45). In order to access all of the screens in Pepe, a subscriber must traverse through at least 18 screens as shown in Figures 28-45. In contrast, the present invention does not have to access multiple screens to modify options. In fact, the communication options, which are displayed on a single screen, may be modified as needed with a few keystrokes. Accordingly, it is respectfully submitted that a single graphical menu containing the communication options is neither disclosed nor reasonably suggested by Pepe et al. Furthermore, claim 20 of the present invention, as amended, additionally requires that the communication options be visually presented on a display terminal via **an individualized web page** associated with the subscriber. As should be appreciated by the Examiner, Pepe is silent to subscriber web pages.

With respect to the secondary references, it is respectfully submitted that the addition of Feit and Bissel to the Pepe patent does not cure the deficiencies of the Pepe et al. patent discussed above. It is the applicant's understanding that each of the cited references completely fails to suggest visually displaying a single graphical menu.

Therefore, for at least the reasons above, it is respectfully submitted that the art of record neither discloses nor reasonably suggests the invention as currently recited in claims 1 and 20. Accordingly, it is respectfully submitted that claims 1 and 20, as amended, are patentable over the art of record.

Claims 2-9, and 21-22 (as well as new claims 23-30) each depend either directly or indirectly from claims 1 and 20 and are therefore respectfully submitted to be patentable over the art of record for least the reasons set forth above. They also require additional elements that when considered in light of the claimed combination further patentably distinguish the present invention.

For example, claim 6 of the present invention, discloses a follow-me service, a follow me service enable option, and a set of numbers. The follow-me service enable option when enabled by the subscriber, permits "a caller" (not a subscriber) to elect to forward a call to a telephone associated with the set of telephone numbers. The follow me service gives the subscriber the ability to designate a set of telephone numbers where he/she may likely be found and gives the caller the option to try and find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. From the caller's perspective, the follow me service is an on-

said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services;

a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computer-implemented control center through said data-centric network, said computer server also being configured to receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication profile database, **wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service**; and

a telephony server coupled to exchange data with said communication profile database, said telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center, said telephony server also being configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

EXHIBIT 8

The American Heritage® Dictionary

of the English Language

FOURTH EDITION

HOUGHTON MIFFLIN COMPANY
Boston New York

Words are included in this Dictionary on the basis of their usage. Words that are known to have current trademark registrations are shown with an initial capital and are also identified as trademarks. No investigation has been made of common-law trademark rights in any word, because such investigation is impracticable. The inclusion of any word in this Dictionary is not, however, an expression of the Publisher's opinion as to whether or not it is subject to proprietary rights. Indeed, no definition in this Dictionary is to be regarded as affecting the validity of any trademark.

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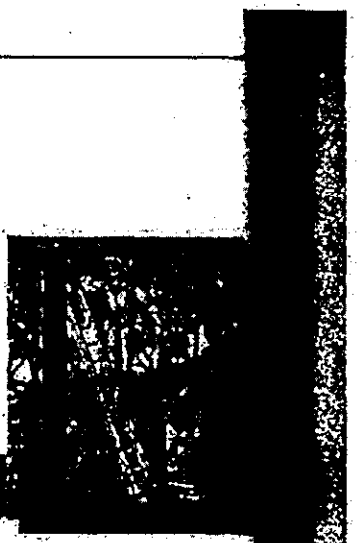


Italian initial letter depicting grape harvesting and winemaking, from a 1476 edition of Pliny the Elder's *Historia Naturalis*.

e[1] or **E** (ē) *n., pl.* **e's** or **E's** also **es** or **Es** **1.** The fifth letter of the modern English alphabet. **2.** Any of the speech sounds represented by the letter *e*. **3.** The fifth in a series. **4.** Something shaped like the letter E. **5. E** A grade that indicates failing status. **6.** *Music* **a.** The third tone in the scale of C major or the fifth tone in the relative minor scale. **b.** A key or scale in which E is the tonic. **c.** A written or printed note representing this tone. **d.** A string, key, or pipe tuned to the pitch of this tone. **7.** *Mathematics* The base of the natural system of logarithms, having a numerical value of approximately 2.71828. **8. E** The hypothesized traditional source of those narrative portions of the Pentateuch in which God is referred to as Elohim rather than with the Tetragrammaton. [Sense 8, from ELOHIM.]

e[2] *abbr.* electron

E *abbr.* **1a.** east **b.** eastern **2.** *Baseball* error **3.** excellent

E. *abbr.* **1.** earl **2.** English

e- also **E-** *pref.* Computer or computer network: *e-cash; e-zine.* See Usage Note at **virtual.** [From E-MAIL.]

E•a (ā'ə) *n. Mythology* The Babylonian god of primordial waters. [Akkadian. See ḫyw in Appendix II.]

each (ēch) *adj.* Being one of two or more considered individually; every: *Each person cast a vote. My technique improved with each lesson.* ◆ *pron.* Every one of a group considered individually; each one. ◆ *adv.* For or to each one; apiece: *ten cents each.* [Middle English *ech*, from Old English *ælc*. See līk- in Appendix I.]

Usage Note The traditional rule holds that the subject of a sentence beginning with *each* is grammatically singular, and the verb and following pronouns must be singular accordingly: *Each of the apartments has* (not *have*) *its* (not *their*) *own private entrance* (not *entrances*). When *each* follows a plural subject, however, the verb and subsequent pronouns remain in the plural: *The apartments each have their own private entrances* (not *has its own private entrance*). But when *each* follows the verb with *we* as its subject, the rule has an exception. One may say either *We boys have each our own room* or *We boys have each his own room*, though the latter form may strike readers as stilted. • The expression *each and every* is likewise followed by a singular verb and, at least in formal style, by a singular pronoun: *Each and every driver knows* (not *know*) *what his or her* (not *their*) *job is to be.* See Usage Notes at **every, they.**

each other *pron.* Each the other. Used to indicate that a relationship or an action is reciprocal among the members of the set referred to by the antecedent: *The boys like each other.*

Usage Note It is often maintained that *each other* should be used to denote a reciprocal relation between two entities, with *one another* reserved for more than two: thus *The twins dislike each other* but *The triplets dislike one another.* Sixty-four percent of Usage Panelists say that they follow this rule in their own writing. But it should be pointed out that many reputable writers from Samuel Johnson onward have ignored the rule and that the use of *each other* for more than two, or of *one another* for two, cannot be considered incorrect. In particular, there are contexts in which *each other* and *one another* are subtly different in meaning. When speaking of an ordered series of events or stages, *one another* is the preferred form. Thus the sentence *The waiters followed one another into the room* was preferred by 73 percent of the Usage Panel to the sentence *The waiters followed each other into the room.* • *Each other* should not be used as the subject of a clause in writing. Instead of *We always know what each other is thinking*, one should write *Each of us knows what the other is thinking.* • The possessive forms of *each other* and *one another* are written *each other's* and *one another's*: *The boys wore each other's* (not *each others'*) *coats. They had forgotten one another's* (not *one anothers'*) *names.*

ea•ger[1] (ē'gər) *adj.* **-ger•er, -ger•est** **1.** Having or showing keen interest, intense desire, or impatient expectancy. See Usage Note at **anxious.** **2.** *Obsolete* Tart; sharp; cutting. [Middle English *eger*, sour, sharp, impetuous, from Anglo-Norman *egre*, from Latin *acer*. See **ak-** in Appendix I.] —**ea'ger•ly** *adv.* —**ea'ger•ness** *n.*

ea•ger[2] (ē'gər, ā'gər) *n.* Variant of **eagre.**

eager beaver *n. Informal* One that is exceptionally, often excessively, industrious or zealous: *"The eager beavers of industry seldom reach their potential, much less rise to the top"* (Newsweek). —**ea'ger-bea'ver** (ē'gər-bē'vər) *adj.*

ea•gle (ē'gəl) *n.* **1.** Any of various large diurnal birds of prey of the family Accipitridae, including members of the genera *Aquila* and *Haliaeetus*, characterized by a powerful hooked bill, keen vision, long broad wings, and strong soaring flight. **2.** A representation of an eagle used as an emblem or insignia. **3.** A gold coin formerly used in the United States, stamped with an eagle on the reverse side and having a face value of ten dollars. **4.** *Sports* A golf score of two strokes under par on a hole. ◆ *v.* **-gled, -gling, -gles** *Sports* —*tr.* To shoot (a hole in golf) in two strokes under par. —*intr.* To score an eagle in golf. [Middle English *egle*, from Anglo-Norman, from Old Provençal *aigla*, from Latin *aquila*.]

eagle eye *n.* **1.** Keen eyesight. **2.** The ability or tendency to observe closely or pay attention to details: *monitors expenses with an eagle eye.* **3.** One that observes with close attention. —**ea'gle-eyed** (ē'gəl-īd') *adj.*

eagle owl *n.* A large Eurasian owl (*Bubo bubo*) having brownish plumage and prominent ear tufts.

eagle ray *n.* Any of numerous rays of the family Myliobatidae, found in tropical and subtropical shallow seas and noted for their massive jaws and large winglike pectoral fins, which they flap for propulsion.

Ea•gle Scout (ē'gəl) *n.* One who has achieved the highest rank in the Boy Scouts.

ea•glet (ē'glĭt) *n.* A young eagle.

ea•gre also **ea•ger** (ē'gər, ā'gər) *n.* See **bore**[3]. [Origin unknown.]

Ea•kins (ā'kĭnz), **Thomas** 1844–1916. American painter known for highly realistic works, such as *Max Schmitt in a Single Scull* (1871).

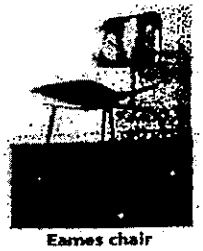
eal•dor•man (ôl'dər-mən) *n.* The chief magistrate of a district in Anglo-Saxon England. [Old English. See ALDERMAN.]

Eames (ēmz), **Charles** 1907–1978. American designer noted for an innovative series of chairs made of aluminum tubing and molded plywood.

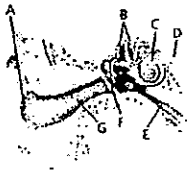
Eames chair A trademark used for a functional chair, originally of molded plywood, with seat and back pieces shaped to the contours of the human body.

ear[1] (ĭr) *n.* **1.** *Anatomy* **a.** The vertebrate organ of hearing, responsible for maintaining equilibrium as well as sensing sound and divided in mammals into the external ear, the middle ear, and the inner ear. **b.** The part of this organ that is externally visible. **2.** An invertebrate organ analogous to the mammalian ear. **3.** The sense of hearing: *a sound that grates on the ear.* **4.** Sensitivity or receptiveness to sound, especially: **a.** Sharpness or refinement of hearing: *a singer with a good ear for harmony.* **b.** The ability to play a passage of music solely from hearing it: *plays the piano by ear.* **c.** Responsiveness to the sounds or forms of spoken language: *a writer with a good ear for dialogue; has an ear for foreign languages.* **5.** Sympathetic or favorable attention: "[The President] *wavers between the two positions, depending on who last had his ear*" (Joseph C. Harsch). **6.** Something resembling the external ear in position or shape, especially: **a.** A flexible tuft of feathers located above the eyes of certain birds, such as owls, that functions in visual communication but not in hearing. Also called *ear tuft.* **b.** A projecting handle, as on a vase or pitcher. **7.** A small box in the upper corner of the page in a newspaper or periodical that contains a printed notice, such as promotional material or weather information. **8. ears** *Informal* Headphones. —***idioms:*** **all ears** Acutely attentive: *Tell your story—we're all ears!* **coming out of (one's) ears** In more than adequate amounts; overabundant. **give (or**

eagle ray
spotted eagle ray
Aetobatus narinari



Eames chair



ear[1]
A. auricle
B. semicircular canals
C. cochlea
D. cochlear nerve
E. Eustachian tube
F. eardrum
G. ear canal

turer who patented (1851) a sewing machine capable of making continuous stitches.

Sing•ha•lese (sĭng'gə-lēz', -lēs') *n. & adj.* A variant of **Sinhalese.**

sin•gle (sĭng'gəl) *adj.* **1.** Not accompanied by another or others; solitary. **2a.** Consisting of one part, aspect, or section: *a single thickness; a single serving.* **b.** Having the same application for all; uniform: *a single moral code for all.* **c.** Consisting of one in number: *She had but a single thought, which was to escape.* **3.** Not divided; unbroken: *a single slab of ice.* **4a.** Separate from others; individual and distinct: *Every single child will receive a gift.* **b.** Having individual opponents; involving two individuals only: *single combat.* **5a.** Honest; undisguised: *a single adoration.* **b.** Wholly attentive: *You must judge the contest with a single eye.* **6.** Designed to accommodate one person: *a single bed.* **7a.** Unmarried. **b.** Lacking a partner: *a single parent.* **c.** Relating to the unmarried state: *enjoys the single life.* **d.** Of or relating to celibacy. **8.** *Botany* Having only one rank or row of petals: *a single flower.* ◆ *n.* **1.** One that is separate and individual. **2.** An accommodation for one person, as in a hotel. **3a.** An unmarried person. **b. singles** Unmarried persons considered as a group: *a bar for singles.* **4.** A one-dollar bill. **5a.** A phonograph record, especially a forty-five, having one song on each side. **b.** A song on one of these sides. **c.** A song, often from a full-length album or compact disk, that is released for airplay. **6.** *Baseball* A hit by which a batter reaches first base safely; a one-base hit. **7.** *Sports* **a.** A hit for one run in cricket. **b.** A golf match between two players. **c.** A tennis or badminton match between two players. Often used in the plural. **d. singles** A competition in which individuals compete against each other, as in rowing or figure skating. ◆ *v.* **-gled, -gling, -gles** —*tr.* **1.** To choose or distinguish from others. Often used with *out*: *We singled her out from the list of applicants.* **2.** *Baseball* **a.** To cause (a base runner) to score or advance by making a one-base hit: *singled him to second.* **b.** To cause the scoring of (a run) by a one-base hit. —*intr. Baseball* To make a single. [Middle English *sengle*, from Old French, from Latin *singulus*. See **sem-**[1] in Appendix I.] —**sin'gle•ness** *n.*

single blind *n.* A testing procedure in which the administrators do not tell the subjects if they are being given a test treatment or a control treatment in order to avoid bias in the results. —**sin'gle-blind'** (sĭng'gəl-blīnd') *adj.*

single bond *n.* A covalent bond in which one electron pair is shared by two atoms.

sin•gle-breast•ed (sĭng'gəl-brĕs'tĭd) *adj.* Closing with a narrow overlap and fastened down the front with a single row of buttons: *a single-breasted suit.*

sin•gle-cell protein (sĭng'gəl-sĕl') *n. Abbr.* **SCP** A protein extracted from cultured algae, yeasts, or bacteria and used as a substitute for protein-rich foods, especially in animal feeds.

single cross *n. Genetics* The hybrid of two inbred lines. It can be represented as A/B, the product of the cross A × B, where A and B represent inbred lines.

single entry *n.* A system of bookkeeping in which a business keeps only a single account showing amounts due and amounts owed.

sin•gle-fam•i•ly (sĭng'gəl-făm'ə-lē, -făm'lē) *adj.* Relating to or being a dwelling designed for one family only: *a single-family home; single-family occupancy.*

single file *n.* A line of people, animals, or things standing or moving one behind the other. Also called *Indian file.* —**single file** *adv.*

sin•gle-foot (sĭng'gəl-fo͝ot') *n.* A rapid gait of a horse in which each foot strikes the ground separately; the rack. No longer in technical use. ◆ *intr.v.* **-foot•ed, -foot•ing, -foots** To go at the single-foot. —**sin'gle-foot'er** *n.*

sin•gle-hand (sĭng'gəl-hănd') *tr.v.* **-hand•ed, -hand•ing, -hands** To sail (a boat) without the help of others: *"a business executive who single-hands her own small cruising cutter"* (Tony Gibbs). —**sin'gle-hand'er** *n.*

sin•gle-hand•ed (sĭng'gəl-hăn'dĭd) *adj.* **1.** Working or done without help; unassisted. **2.** Intended for use with one hand. **3.** Having or using only one hand. ◆ *adv.* In a single-handed manner. —**sin'gle-hand'ed•ly** *adv.* —**sin'gle-hand'ed•ness** *n.*

sin•gle-heart•ed (sĭng'gəl-här'tĭd) *adj.* Sincere and dedicated. —**sin'gle-heart'ed•ly** *adv.* —**sin'gle-heart'ed•ness** *n.*

sin•gle•hood (sĭng'gəl-ho͝od') *n.* The state of being unmarried.

sin•gle-is•sue (sĭng'gəl-ĭsh'o͞o) *adj.* Of, relating to, or concerned with a single public issue, especially a controversial one, to the exclusion of all other issues: *single-issue groups; single-issue politics.*

single knot *n.* See **overhand knot.**

sin•gle-lens reflex (sĭng'gəl-lĕnz') *adj. Abbr.* **SLR** Of or designating a form of reflex camera in which the reflecting mirror retracts when the shutter is released.

sin•gle-mind•ed (sĭng'gəl-mīn'dĭd) *adj.* **1.** Having one overriding purpose or goal: *the single-minded pursuit of money.* **2.** Steadfast; resolute: *He was single-minded in his determination to stop smoking.* —**sin'gle-mind'ed•ly** *adv.* —**sin'gle-mind'ed•ness** *n.*

sin•gle-phase (sĭng'gəl-fāz') *adj.* Producing, carrying, or powered by a single alternating voltage.

sin•gles bar (sĭng'gəlz) *n.* A bar patronized especially by unmarried men and women.

sin•gle-sex (sĭng'gəl-sĕks') *adj.* Same-sex.

sin•gle-space (sĭng'gəl-spās') *v.* **-spaced, -spac•ing, -spac•es** *tr.v.* To type, print, or format (copy) without leaving a blank line between lines. —*intr.* To type, print, or format copy without leaving a blank line between lines.

single standard *n.* A set of principles with the same standard for all, especially regarding the sexual behavior of both men and women.

sin•gle•stick (sĭng'gəl-stĭk') *n.* **1.** A one-handed fencing stick fitted with a hand guard. **2.** The art, sport, or exercise of fencing with such a stick.

sin•gle•stick•er (sĭng'gəl-stĭk'ər) *n.* A sailboat with one mast; a sloop.

sin•glet (sĭng'glĭt) *n.* **1.** *Chiefly British* A man's jersey undershirt. **2.** *Physics* A multiplet with a single member.

single tax *n.* A system by which all revenue is derived from a tax on one thing, especially land.

sin•gle•ton (sĭng'gəl-tən) *n.* **1.** *Games* A playing card that is the only one of its suit in a player's hand. **2a.** An individual separated or distinguished from two or more of its group. **b.** An offspring born alone. [From the name *Singleton* (influenced by SINGLE).]

sin•gle-track (sĭng'gəl-trăk') *adj.* **1.** Having just one track: *single-track railway.* **2.** Lacking mental range or flexibility; one-track: *a single-track mind.*

sin•gle•tree (sĭng'gəl-trē') *n.* See **whiffletree.** [Alteration (influenced by DOUBLETREE) of SWINGLETREE.]

sin•gle•wide (sĭng'gəl-wīd') *n.* A mobile home 14 feet (4.3 meters) in width, used as a permanent residence. —**sin'gle•wide'** *adj.*

sin•gly (sĭng'glē) *adv.* **1.** Without the presence of others; alone. **2.** Without the help of others; single-handed. **3.** One by one; individually.

sing•song (sĭng'sông', -sŏng') *n.* **1.** Verse characterized by mechanical regularity of rhythm and rhyme. **2.** A monotonously rising and falling inflection of the voice. ◆ *adj.* Monotonous in vocal inflection or rhythm. —**sing'song'y** *adj.*

sing•spiel (zĭng'shpēl', zĭng'spēl') *n.* An 18th-century German musical comedy featuring songs and ensembles interspersed with dialogue. [German : *singen*, to sing (from Middle High German, from Old High German *singan*; see **seng^h-** in Appendix I) + *Spiel*, play; see SPIEL.]

sin•gu•lar (sĭng'gyə-lər) *adj.* **1.** Being only one; individual. **2.** Being the only one of a kind; unique. **3.** Being beyond what is ordinary or usual; remarkable. **4.** Deviating from the usual or expected; odd. See synonyms at **strange.** **5.** *Grammar* **a.** Of, relating to, or being a noun, pronoun, or adjective denoting a single person or thing or several entities considered as a single unit. **b.** Of, relating to, or being a verb expressing the action or state of a single subject. **6.** *Logic* Of or relating to the specific as distinguished from the general; individual. ◆ *n. Grammar* **1.** The singular number or a form designating it. **2.** A word having a singular number. [Middle English *singuler*, from Old French, from Latin *singulāris*, from *singulus*, single. See SINGLE.] —**sin'gu•lar•ly** *adv.* —**sin'gu•lar•ness** *n.*

sin•gu•lar•i•ty (sĭng'gyə-lăr'ĭ-tē) *n., pl.* **-ties** **1.** The quality or condition of being singular. **2.** A trait marking one as distinct from others; a peculiarity. **3.** Something uncommon or unusual. **4.** *Astrophysics* A point in space-time at which gravitational forces cause matter to have infinite density and infinitesimal volume, and space and time to become infinitely distorted. **5.** *Mathematics* A point at which the derivative does not exist for a given function but every neighborhood of which contains points for which the derivative exists. Also called *singular point.*

sin•gu•lar•ize (sĭng'gyə-lə-rīz') *tr.v.* **-ized, -iz•ing, -iz•es** To make conspicuous; distinguish.

singular point *n.* See **singularity** (*sense* 5).

sin•gu•la•tive (sĭng'gyə-lā'tĭv, -lə-tĭv) *adj.* Of or relating to a linguistic form or construction that expresses a singular entity, often as opposed to a collective, such as *rice-grain* as opposed to *rice.* ◆ *n.* A singulative form or construction. [French *singulatif*, from Latin *singillātim*, *singulātim*, one at a time, singly, from *singulus*, single. See SINGLE.]

sinh *abbr.* hyperbolic sine

Sin•ha•la (sĭn-hä'lə) *n., pl.* **Sinhala** or **-las** **1.** A Sinhalese. **2.** The Sinhalese language. [Sinhala *Sinhala*, from Sanskrit *sinhalah*, Sri Lanka, from *sinhah*, lion (perhaps from the former presence of lions there).]

Sin•ha•lese (sĭn'hə-lēz', -lēs') also **Sing•ha•lese** (sĭng'gə-lēz', -lēs') *n., pl.* **Sinhalese** or **Singhalese** **1.** A member of a people constituting the majority of the population of Sri Lanka. **2.** The Indic language of the Sinhalese that is the chief language of Sri Lanka. ◆ *adj.* Of or relating to Sri Lanka, the Sinhalese, or their language or culture. [Sanskrit *Sinhalam*, Sri Lanka + -ESE.]

Si•ni•cism (sī'nĭ-sĭz'əm, sĭn'ĭ-) *n.* A custom or trait peculiar to the Chinese. [From *Sinic*, Chinese, from Medieval Latin *Sinicus*, from Late Latin *Sinae*, the Chinese. See SINO-.]

Si•ni•cize (sī'nĭ-sīz', sĭn'ĭ-) *tr.v.* **-cized, -ciz•ing, -ciz•es** To make Chinese in character or to change or modify by Chinese influence. —**Si'ni•ci•za'tion** (-sĭ-zā'shən) *n.*

Si•ni•fy (sī'nə-fī', sĭn'ə-) *tr.v.* **-fied, -fy•ing, -fies** To Sinicize. [Late Latin *Sinae*, the Chinese; see SINO- + -FY.] —**Si'ni•fi•ca'tion** (-fĭ-kā'shən) *n.*

sin•is•ter (sĭn'ĭ-stər) *adj.* **1.** Suggesting or threatening evil: *a sinister smile.* **2.** Presaging trouble; ominous: *sinister storm clouds.* **3.** Attended by or causing disaster or inauspicious circumstances. **4.** On the left side; left. **5.** *Heraldry* Situated on or being the side of a shield on the wearer's left and the observer's right. [Middle English *sinistre*, unfavorable, from Old French, from Latin *sinister*, on the left, unlucky.] —**sin'is•ter•ly** *adv.* —**sin'is•ter•ness** *n.*

Isaac M. Singer

single-breasted
single-breasted blazer

Synonyms *sinister, baleful, malign* These adjectives apply to what is indicative of or threatens great harm, disaster, or evil. *Sinister* usually implies impending or lurking danger that makes its presence felt by ominous signs or portents: *We heard a sinister laugh from behind the door. Baleful* intensifies the sense of menace; it suggests a deadly, virulent, or poisonous quality: *The guard's baleful glare frightened the children. Malign* applies to what manifests an evil disposition, nature, influence, or

ă pat	oi boy
ā pay	ou out
âr care	o͝o took
ä father	o͞o boot
ĕ pet	ŭ cut
ē be	ûr urge
ĭ pit	th thin
ī pie	*th* this
îr pier	hw which
ŏ pot	zh vision
ō toe	ə about, item
ô paw	✦ regionalism

Stress marks: ˈ (primary); ˌ (secondary), as in dictionary (dĭkˈshə-nĕrˌē)

EXHIBIT 9

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EXHIBIT 10

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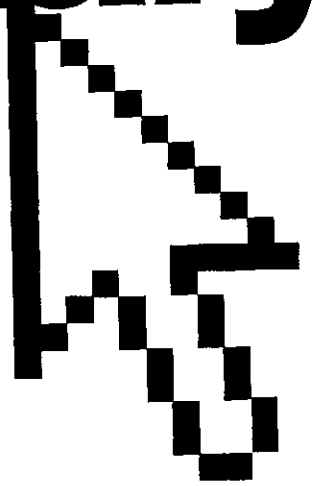
Fourth Edition



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Acquisitions Editor: Christey Bahn
Project Editor: Kim Fryer

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dirty *adj.* Of, pertaining to, or characteristic of a communications line that is hampered by excessive noise, degrading the quality of the signal. *See also* noise (definition 2).

dirty bit *n.* A bit used to mark modified data in a cache so that the modifications may be carried over to primary memory. *See also* bit, cache.

dirty power *n.* A power source that can cause damage to electronic components, due to noise, voltage spikes, or incorrect voltage levels.

dirty ROM \dər`tē rom`\ *n.* Short for **dirty read-only memory**. In the earlier versions of the Macintosh (Mac II, IIx, SE/30, and IIcx), a memory system that simulates a 32-bit system but is not a true (clean) 32-bit system. Among other flaws, a dirty ROM machine can access only 8 megabytes of memory under Mac OS System 7. System extensions such as MODE32 and the 32-bit enabler are available to allow a dirty ROM machine to function like a true, 32-bit clean machine.

disable *vb.* To suppress something or to prevent it from happening. Disabling is a method of controlling system functions by disallowing certain activities. For example, a program might temporarily disable nonessential interrupts (requests for service from system devices) to prevent interruptions during a critical point in processing. *Compare* enable.

disabled folders *n.* In the Mac OS, several folders in the System folder that contain system extensions, control panels, and other items that have been removed from the system by the extension manager. Items currently in disabled folders will not be installed upon system startup; they may, however, later be moved back to their regular folders automatically by the extension manager. *See also* extension manager, System folder.

disassembler *n.* A program that converts machine code to assembly language source code. Most debuggers have some kind of built-in disassembler that allows the programmer to view an executable program in terms of human-readable assembly language. *See also* decompiler. *Compare* assembler.

disassociate *vb.* In Windows 95 and NT, to remove an association between a file and some application. *Compare* associate.

disaster dump *n.* A dump (transfer of memory contents to a printer or other output device) made when a program fails without hope of recovery.

disc *n.* A round, flat piece of nonmagnetic, shiny metal encased in a plastic coating, designed to be read from and written to by optical (laser) technology. It is now standard practice to use the spelling *disc* for optical discs and *disk* in all other computer contexts, such as floppy disk, hard disk, and RAM disk. *See also* compact disc.

disconnect *vb.* To break a communications link.

discrete *adj.* Separate; individual; identifiable as a unit. For example, bits are discrete elements of data processed by a computer.

discrete multitone *n.* In telecommunications, a technology that uses digital signal processors to split available bandwidth into a number of subchannels, allowing over 6 Mbps of data to be carried over one copper twisted-pair wire. *Acronym:* DMT.

discretionary hyphen *n. See* hyphen.

discussion group *n.* Any of a variety of online forums in which people communicate about subjects of common interest. Forums for discussion groups include electronic mailing lists, Internet newsgroups, and IRC channels.

dish *n. See* satellite dish

disk *n.* **1.** A round, flat piece of flexible plastic coated with a magnetic material that can be electrically influenced to hold information recorded in digital (binary) form and encased in a protective plastic jacket to protect them from damage and contamination. *Also called* floppy, floppy disk, microfloppy disk. *Compare* compact disc, disc. **2.** *See* hard drive.

disk access time *n. See* access time (definition 2).

disk buffer *n.* A small amount of memory set aside for the purpose of storing data read from, or soon to be written to, a disk. Because disk devices are slow compared with the CPU, it is not efficient to access the disk for only one or two bytes of data. Instead, during a read, a large chunk of data is read and stored in the disk buffer. When the program wants information, it is copied from the buffer. Many requests for data can be satisfied by a single disk access. The same technique can be applied to disk writes. When the program has information to store, it writes it into the disk buffer area in memory. When the buffer has been filled, the entire contents of the buffer are written to the disk in a single operation.

disk cache *n.* A portion of a computer's random access memory (RAM) set aside for temporarily holding

emitter *n.* In transistors, the region that serves as a source of charge carriers. *Compare* base (definition 3), collector.

emitter-coupled logic *n.* A circuit design in which the emitters of two transistors are connected to a resistor so that only one of the transistors switches at a time. The advantage of this design is very high switching speed. Its drawbacks are the high number of components required and susceptibility to noise. *Acronym:* ECL.

E

EMM *n. See* Expanded Memory Manager.

e-money or **emoney** \ē´mən`ē\ *n.* Short for electronic **money**. A generic name for the exchange of money through the Internet. *Also called* cybercash, digicash, digital cash, e-cash, e-currency.

emotag \ē´mō-tag`\ *n.* In an e-mail message or newsgroup article, a letter, word, or phrase that is encased in angle brackets and that, like an emoticon, indicates the attitude the writer takes toward what he or she has written. Often emotags have opening and closing tags, similar to HTML tags, that enclose a phrase or one or more sentences. For example: <joke>You didn't think there would really be a joke here, did you?</joke>. Some emotags consist of a single tag, such as <grin>. *See also* emoticon, HTML.

emoticon \ē-mō´ti-kon`\ *n.* A string of text characters that, when viewed sideways, form a face expressing a particular emotion. An emoticon is often used in an e-mail message or newsgroup post as a comment on the text that precedes it. Common emoticons include :-) or :) (meaning "I'm smiling at the joke here"), ;-) ("I'm winking and grinning at the joke here"), :-(("I'm sad about this"), :-7 ("I'm speaking with tongue in cheek"), :D or :-D (big smile; "I'm overjoyed"), and :-O (either a yawn of boredom or a mouth open in amazement). *Compare* emotag.

EMS *n.* Acronym for Expanded Memory Specification. A technique for adding memory to PCs that allows for increasing memory beyond the Intel 80x86 microprocessor real-mode limit of 1 megabyte. In earlier versions of microprocessors, EMS bypassed this memory board limit with a number of 16-kilobyte banks of RAM that could be accessed by software. In later versions of Intel microprocessors, including the 80386 and 80486 models, EMS is converted from extended memory by software memory managers, such as EMM386 in MS-DOS 5. Now EMS is used mainly for older MS-DOS applications because Windows and other applications running in protected mode on 80386 and higher microprocessors are free of the 1-MB limit. *Also called* LIM EMS. *See also* expanded memory, protected mode. *Compare* conventional memory, extended memory.

em space *n.* A typographical unit of measure that is equal in width to the point size of a particular font. For many fonts, this is equal to the width of a capital M, from which the em space takes its name. *Compare* en space, fixed space, thin space.

emulate *vb.* For a hardware or software system to behave in the same manner as another hardware or software system. In a network, for example, microcomputers might emulate terminals in order to communicate with mainframes.

emulation *n.* The process of a computer, device, or program imitating the function of another computer, device, or program.

emulator *n.* Hardware or software designed to make one type of computer or component act as if it were another. By means of an emulator, a computer can run software written for another machine. In a network, microcomputers might emulate terminals in order to communicate with mainframes.

emulsion laser storage *n.* A method for recording data in film by selective heating with a laser beam.

enable *vb.* To activate or turn on. *Compare* disable.

encapsulate *vb.* **1.** To treat a collection of structured information as a whole without affecting or taking notice of its internal structure. In communications, a message or packet constructed according to one protocol, such as a TCP/IP packet, may be taken with its formatting data as an undifferentiated stream of bits that is then broken up and packaged according to a lower-level protocol (for example, as ATM packets) to be sent over a particular network; at the destination, the lower-level packets are assembled, re-creating the message as formatted for the encapsulated protocol. *See also* ATM (definition 1). **2.** In object-oriented programming, to keep the implementation details of a class a separate file whose contents do not need to be known by a programmer using that class. *See also* object-oriented programming, TCP/IP.

Encapsulated PostScript *n. See* EPS.

encapsulated type *n. See* abstract data type.

encapsulation *n.* In object-oriented programming, the packaging of attributes (properties) and functionality (methods or behaviors) to create an object that is es-

EXHIBIT 11

REDACTED

EXHIBIT 12

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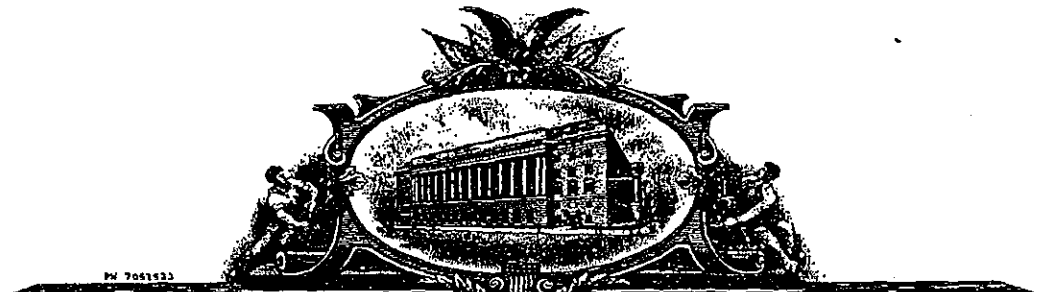
EXHIBIT 13



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callers requiring special treatment, and the special treatment that is provided to them. Callers can be identified by CLID, or by an Identification Password entered through DTMF. An Identification Password can be given by the subscriber to a group of callers, allowing all of them access to the same special treatment, without the subscriber having to individually identify them all on the Caller List 26. A special treatment can be a System Announcement, in situations where the subscriber does not wish to communicate with the caller, or Messaging if the subscriber is willing to take messages from the caller but does not want to have the caller directly connected. Also, a special treatment can give a call a Normal, Priority, or Emergency status, if the call is to be forced to a specific status level. CLIDs can be specified by range, allowing the subscriber to give special treatment to a group of callers, e.g. all callers in local area code are routed to Messaging. A name can be associated with each entry in the list. This name is used to help in any list validation and simplify communication of subscriber requirements to the service administrator.

An example of a typical Caller List is shown below in Table 1.0

TABLE 1.0

NUMBERS	NAME	PASSWORD	SPECIAL TREATMENT
123-1111	GRANDMA		PRIORITY
444-1212	X-SPOUSE		MESSAGING
444-1313			
521-1212	X-SPOUSE'S LAWYER		SYSTEM ANNOUNCEMENT 1
555-9999	FAMILY	911911	PRIORITY
632-1234	BOSS	8020	PRIORITY, ANNOUNCE
452-XXXX	BRW		SYSTEM ANNOUNCEMENT 8

In table 1.0, "Numbers" show the CLID(s) associated with the caller. If a call from this CLID is directed to the subscriber, the special treatment will automatically be provided. If a caller enters a password associated with an entry in the Callers List, that caller will be identified to the subscriber, in a Shared Phone Announcement, by the CLID associated with that password and entry.

"Name" is a text string associated with an entry, for use by the system operator or service representative. It is also provided to the subscribers when a printed copy of the profile is sent to them for verification purposes.

"Password" is a numeric string that can be entered by a caller, and when entered, will provide the caller with the special treatment associated with that entry.

"Special Treatment" is the special handling that callers identified as being associated with this entry will receive. Important callers may receive "Priority" or "Emergency" call status, other callers may be designated to receive only a Messaging treatment, or just one of a set of pre-recorded system announcements.

Referring again to FIG. 1b, another file which also makes up the subscriber's profile is the Subscriber Number List 27. This list stores the network addresses and types of the devices and usual destinations to be used when communicating with the subscriber or leaving a message for the subscriber. The Subscriber Number List can also store the ringing time allowed at each device when attempting to connect a call. This flexibility allows calls to be progressed at the optimal speed. For example, slowly past devices which the subscriber needs time to answer, and quickly past devices which would be answered almost immediately if the subscriber was there to take the call.

An example of a Subscriber Number List is shown below in Table 2.0.

TABLE 2.0

ID	NAME	NUMBER	TYPE	RINGS
1	HOME	123-1234	BY-PASS ALLOWED	5
1	OFFICE	555-1234	SOLE USE	3
3	CAR	999-1234	ANNOUNCE CALLER	2
4	COTTAGE	777-1234	SHARED	3

OTHER DEVICES	NUMBER
PAGER:	551-1155
TYPE:	DIGITAL
MESSAGE SYSTEM:	922-2222
MAILBOX NUMBER:	1234
MAILBOX PASSWORD:	555
MWI COORDINATION:	YES
OPERATOR:	333-4567

As shown in Table 2.0, "IDs" are numbers used to refer to specific devices by the subscriber when changing locations, e.g. only "1#" is needed to identify the subscriber's home location.

"Name" is the pre-determined system name for locations. This can be Home, Car, Portable, Office, Cottage, Boat, etc.

"Number" is the network address of the device.

"Type" indicates whether the Shared Phone Call Announcement should occur when calls are extended to that device/location, or if all calls to that device/location should have the caller announced, or if the device can be "by-passed" (this indicates whether PCS can bypass itself when a call is directed to this location when filtering or call announcing is not required).

"Rings" indicates how long a device should be rung before "no-answer" is assumed.

"Other Devices" include the possible destinations for completing calls when a subscriber can't be reached. These can be a pager, a messaging system, or a private operator. Sufficient information is provided to allow PCS to complete the call to these destinations.

Also part of the subscriber's profile is the Subscriber's Schedule 28. Some subscribers may wish to change, at regular intervals, the way their calls are managed, e.g. only emergency calls after 11 p.m. weekdays and after midnight on weekends. Further, they may have a pattern of movement from device to device which can also be described in a schedule. The Subscriber's Schedule allows, for example, the elimination of subscriber and/or operator interaction to support regularly occurring changes. Multiple time slots can be specified, e.g. Monday–Friday 0900–1700 hours, Saturday 1030–2330 hours, and "other" which defines what happens for non-specified time slots. For each of these predefined time slots, the Schedule can list the default devices to use in contacting the subscriber during that time, e.g. Monday–Friday 0730–0800 hours use car or home number, Monday–Friday 0800–0830 hours use car or office number. This schedule could be set for the subscriber who spends half an hour commuting each morning, leaving sometime between 8:00 and 8:30 a.m.. Similarly, the Schedule allows each slot to have an urgency of calls which the subscriber will accept, e.g. only urgent

calls after 5 p.m. on weeknights and on weekends. Those subscribers who do not use scheduled changes can have a single, all-inclusive entry in their schedule, indicating their default location and interruptability.

An example of the Subscriber Schedule is shown below in Table 3.0.

TABLE 3.0

DAY	TIME	INTERRUPT-ABILITY	DEVICES
M-F	8-9	NORMAL	CAR, OFFICE
M-F	9-17	NORMAL	OFFICE
M-F	17-23	PRIORITY	HOME, CAR
SA-SU	9-17	PRIORITY	HOME, CAR, COTTAGE
DS-SU	17-23	PRIORITY	HOME, CAR
OTHER		EMERGENCY	HOME

"Day" and "Time" are used to determine which time period(s) and entry in the schedule applies to.

"Interruptability" indicates the urgency of calls that the subscriber will accept during the time period(s) specified by the entry.

"Devices" indicates which device(s)/location(s) are to normally be used when attempting to connect to the subscriber during the time period(s). Names refer to entries in the Subscriber Number List.

In addition to the Subscriber Schedule, a Call Completion Schedule is used to determine what action the system should take with a call when the caller is normally allowed to reach the subscriber, but the subscriber couldn't be reached, or was not interruptible. Table 4.0 shown below provides an example of a Call Completion Schedule.

TABLE 4.0

DAY	TIME	TREATMENT	URGENCY
M-F	9-17	MESSAGE	NORMAL
M-F	9-17	OPERATOR	PRIORITY
M-F	17-23	QUERY (MESSAGE, PAGER)	PRIORITY
M-F	17-23	MESSAGE	NORMAL
SA-SU	8-20	QUERY (MESSAGE, PAGER)	PRIORITY
SA-SU	8-20	MESSAGE	NORMAL
OTHER		MESSAGE	NORMAL
OTHER		QUERY (MESSAGE, PAGER)	EMERGENCY

"Day" and "Time" indicates which days and over which time ranges a particular treatment will be provided to a caller. "Other" is used to refer to all times not otherwise specified.

"Treatment" indicates what should be done with a call that could not be terminated by connecting it to the subscriber. Options are "Message", "Pager", "Operator", and "Query". "Query" treatment results in the caller being asked for his choice of 2 or more of the 3 available treatments.

"Urgency" indicates that only calls of at least the specified urgency are to receive that treatment. This allows calls of different urgencies to be terminated differently, e.g. to an operator (secretary) or to messaging.

Also part of the subscriber's profile are other Data files which store other subscriber information necessary to operate PCS or provide the subscriber with prompt and courteous operator service. An example of this data is shown below in Table 5.0.

TABLE 5.0

PERSONAL NUMBER:	416-555-1111
BYPASS ACCESS:	416-555-9999
BYPASS PASSWORD:	12345
NAME:	SUBSCRIBER NAME
PASSWORD	1234
OTHER PERSONAL #S:	
MESSAGING PASSWORD	9876
CALLING CARD #:	416 555-1212 XXXX
LANGUAGE:	ENGLISH
ALLOWED FEATURES:	PAGER, SYSTEM OPERATOR REVERT, URGENCY
CALL ANNOUNCE NAME RECORDING:	NO
CALL URGENCY QUERY:	PRIORITY
ROTARY DEFAULT:	NORMAL
NOTES:	CUSTOMER IS HARD OF HEARING - SPEAK SLOWLY AND CAREFULLY WHEN GIVING ASSISTANCE

"Personal Number" is the PN of the subscriber.

"Bypass Access" and "Bypass Password" are used to directly route the Personal Number to an allowed subscriber location, using a network based forwarding feature.

"Other Personal #(s):", "Name", and "Notes:" are examples of textual comment fields which can be associated with the subscriber profile to facilitate service.

"Password" is the identification number for the subscriber, which can be used for operator verification of subscriber identity, or when the subscriber is calling the Subscriber Service Interface.

"Calling Card #" is used to charge PCS placed calls when the subscriber has directed calls to a location not local to the host node 11.

"Language" is the language to be used for the playing prompts to Subscriber's callers.

"Allowed Features" indicates which features this subscriber has access to. The options listed in Table 5.0 are for example only, and may vary according to what is specified by the PCS service provider.

"Call Announce Name Recording" indicates whether unknown callers should be prompted to record their names when Call Announcing is required.

"Call Urgency Query" can be "none", "priority", or "emergency". If "none", calls which are not assigned an urgency in the caller list will always be assumed "normal".

A Schedule Override feature has been provided since many subscriber's schedules are subject to variations. This override allows the subscriber to adjust the schedule for current circumstances without having to permanently change the schedule. For example, the subscriber can shift the next or previous scheduled change so that they occur earlier or later, or for all scheduled changes to be suspended until a future date/time. This, for example, can be useful when the subscriber is off sick, on vacation or just running a little late. Similarly, while a subscriber may normally desire that only urgent calls be connected after 5 p.m., he may wish to extend that when waiting for calls which the system will not be able to identify as urgent.

When a subscriber overrides his scheduled location to a location not in the device/location list, the new location will be assumed to be "shared", with PCS confirming that the subscriber is at the location before connecting the call. In this example, if three calls to the location are made, and no DTMF response is received by PCS to the confirmation request, or if the response indicates that the relocation is to be cancelled, PCS will cancel

handling the vacationing doctor's calls. A shift foreman can schedule incoming calls to other foremen depending on time of day in one embodiment, calling parties may be instructed to enter a Personal Identification Number (PIN) before the call will be connected. According to U.S. Pat. Nos. 5,497,414 and 5,506,887, there also exist called party control at the network level for control of call routing. A so-called advanced intelligent network (AIN) wireline system connects to and controls processing of calls to a personal communication service subscriber's wireless handset via a home base station or a wireless communication network. For example, in response to incoming calls to the subscriber, if predetermined, the AIN accesses a home location register to determine the current location where the subscriber's handset is located. The AIN can then use that data to route the calls to the subscriber at the preregistered new location. Determination of call processing is thus made as a network *feature rather than as a switch feature.*

Despite these advances in the telecommunication arts, there remains a need to provide further enhancements to provide called party control of new services including but not limited to store and forward messaging, media conversion, network conversion, home management and so-called Personal Reach or related personal telecommunications routing services.

SUMMARY OF THE INVENTION

According to the principles of the present invention, the called party is provided control of incoming calls and, most importantly, over new services including but not limited to store and forward messaging, media conversion, network conversion, home management and so-called Personal Reach or related personal telecommunications routing service. Moreover, the present invention may be provided in a customer premises equipment or a local or toll network setting. It is not limited to implementation in the form of *control apparatus for a private branch exchange.* Also, the called party does not have to physically participate in the real time decision making.

According to a first principle of the present invention, all possible information about the calling party that can be obtained is obtained. The identity of the calling party as to individual or limited group is determined based on explicitly requesting a personal identification code (individual) or a more generally available access code (limited group). According to a further embodiment of the present invention, an emergency code may be further requested in the event of an urgent need by the calling party to speak with the called party. Moreover, through automatic number identification facilities and the like, the calling party's originating telephone number may be determined. In Internet services, the E-Mail address is determined from data in the forwarded connecting data call. Also, the called party controls services by entering into memory a complete listing of expected calling party information and personal schedule of availability to receive calls.

According to the second principle of the present invention, a treatment table is provided that is calling party identity dependent. The service point, customer premises equipment, E-Mail host, end office or toll office applies different predetermined services for one of terminating, completing or otherwise serving the calling party as specified in the treatment table in advance by the called party. For example, an incoming call may be forwarded to, for example, Personal Reach service or a related personal telecommunications routing service where the called party is paged and allowed to decide in real time whether to connect to a bridge or link to the caller or to allow at least voice-mail/fax-mail treatment.

Finally, according to the last principle of the present invention, the service point is provided with the capability and the predetermined control software to apply all the different routing or screening or other treatments as defined in the treatment table and according to predetermined priority. Moreover, the various actions may be predetermined by time of day and day of week so that, even outside of the normal business day, the present invention may be applied to advantage.

These and other features of the present invention will be best understood from studying the drawings of the present method for called party control and suggested apparatus for implementing the method showing exemplary block schematic diagrams of network switch equipment and customer premises equipment and flowcharts for providing service via either form of equipment. The present invention should not be construed to be limited to the claimed method or the depicted suggested embodiments as the principles may be further applied in an Internet environment or a non-telecommunications network environment as well.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an overall flowchart for describing the three principles of the method and apparatus of the present invention for providing called party control of telecommunications network services.

FIG. 2 extends the overall flowchart of FIG. 1 to provide a high level call processing flowchart for an incoming call from a calling party in any environment to a called party.

FIGS. 2 and 3 relate to providing the method and apparatus of the present invention, by way of example, at a network switch, an end office or toll office.

FIG. 3 is a block schematic diagram of network switch apparatus for providing the features and method of the present invention; reference numbers provided for defining elements of the switch are referred to in the call processing flowchart of FIG. 4.

FIG. 4 comprises three figures of call processing flowcharts for implementation via the network switch apparatus of FIG. 3; reference numerals included within boxes of the flowchart refer to elements of the apparatus of FIG. 3.

FIG. 4A represents the initial progress of the incoming call while FIGS. 4B and 4C represent further stages; reference numerals in circles indicate connecting points between boxes of the several flowcharts.

FIGS. 5 and 6 relate to providing the method and apparatus of the present invention, by way of example, at customer premises equipment at a subscriber location, be it a single customer or a business user, telephone apparatus or a private branch exchange or related customer apparatus.

FIG. 5 is a block schematic diagram of customer premises equipment, station equipment or private branch exchange equipment for providing the features of the present invention; reference numerals provided for defining elements of the equipment are referred to in the call processing flowchart of FIG. 6.

FIG. 6 comprises three figures of call processing flowcharts for implementation via the customer premises equipment of FIG. 5; reference numerals included within the boxes of the flowchart refer to elements of the customer premises equipment of FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

There exist three guiding principles of the method of the present invention for providing called party control of

REMARKS

Applicants and applicants' attorney express appreciation to the Examiner for the courtesies extended during the recent interview held on October 17, 2001. The claim amendments made by this paper are consistent with the proposals discussed, and the agreements reached, during the interview.

The Office Action of July 30, 2001, rejected claims 1-3, 5-13, 15-25, 27-40, and 42-51 under 35 § 102(b) as being anticipated by U.S. Patent No. 5,329,578 to Brennan. The Office Action also rejected claims 4, 14, 26, and 41 as being unpatentable over Brennan in view of U.S. Patent No. 6,005,870 to Leung.

The communication services taught by Brennan are illustrated, for example, by Figures 2a-2g and by Figures 3a-3e. Figures 2a-2g describe the flow of information at the caller interface when an individual is calling a user and describe what happens to an incoming call of the caller. Figures 3a-3e describe a user service interface illustrating how a menu is accessed by a user and how a user is able to change or set the user specifications that determine how an incoming call is processed. With regard to Figures 2a-2g, Brennan teaches that the flow of information is fixed and is not dependent on any particular status or activity of the user or of the caller and that the flow of information is determined by the user's requirements for that particular caller.

For example, Brennan teaches that if the incoming call includes calling line identification (CLID), then the profile of the user or subscriber is accessed to determine whether the CLID matches one of the CLIDs of the callers on the user's caller list, which determines how to treat the incoming call. *See* Brennan col. 11, lines 40-45. If the CLID of the caller is present in the caller list, then the special treatment, as indicated in the caller list for that caller, is taken.

Otherwise, the default treatment of an incoming call is assumed in this example. Thus, the treatment of an incoming call is dependent on a caller list that does not change. More specifically, actions or activity of callers on a telephone network or on a computer network have no effect on the caller list or on other user requirements for callers.

This is evident is Brennan, where a user is required to call a special number in order to access and/or alter the user requirements for different callers. *See* Brennan col. 13, lines 7-15. This is plainly illustrated in Figure 3a, where the user is able to access and change the caller lists and user requirements over the telephone network. Thus, Brennan teaches that the user requirements or the caller lists do not change unless the user expressly changes the user requirements or unless the user specifically requests a system operator to make the changes to the user requirements. *See* Brennan col. 13, lines 14-16.

In contrast to Brennan, claim 1 as amended recites that the one or more lists used in filtering an incoming call change according to current activity of the subscribers (e.g., persons making the calls), or according to current activity of the user (e.g., intended recipient of the call). In one example, the current activity of the subscriber and/or the user does not typically occur on the telephone network. Instead the current activity of the subscriber and/or the user usually occurs on a computer network. The ability to process an incoming call on a telephone network according to activity on a computer network is not taught or suggested by Brennan.

For at least these reasons and for the reasons discussed at the interview, Brennan does not teach or anticipate claim 1 as amended and claim 1 is believed to be in condition for allowance. For similar reasons, the other independent claims, namely claims 21, 28, and 38, are not taught or anticipated by Brennan and are in condition for allowance. The remaining dependent claims,

which depend from one of the independent claims, are in condition for allowance for similar reasons.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney.

Dated this 28 day of December, 2001.

Respectfully submitted,

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022913

PATENT TRADEMARK OFFICE

G:\DATA\WPDOCS2\CTR\OFFICE ACTIONS\13768.67.19 AMENDMENT A.DOC

VERSION WITH MARKINGS TO CHANGES MADE
(13768.67.19)

In the claims:

1. (Amended) In an environment where subscribers call a user over a telephone network, wherein a user telephone is coupled with the telephone network, a [A] system for processing an incoming call from a subscriber to a user in the telephone network according to user specifications [user specification of call processing in a telephone network having a user telephone coupled to the telephone network], the system comprising:

a data structure contained within a computer network to store user-selectable criteria for call processing, wherein the data structure stores the user-selectable criteria in one or more lists that are used in filtering an incoming call and wherein some of the one or more lists are used to filter the incoming call according to current activity of subscribers on the computer network or according to current activity of the user on the computer network;

a computer network access port used by the telephone network to access the data structure such that the telephone network has access to the one or more lists over the computer network access port; and

a controller to receive [an] the incoming call designated for the user telephone and to process the incoming call in accordance with the user-selectable criteria, the controller accessing the user-selectable criteria in the one or more lists of the data structure via the computer network access port and thereby applying the user-selectable criteria to the incoming call.